

ORGANIC CHEMISTRY

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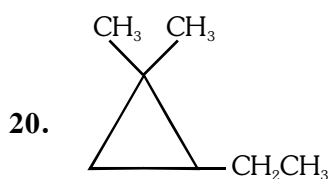
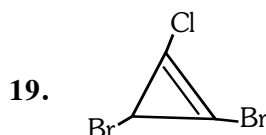
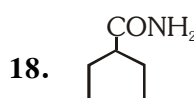
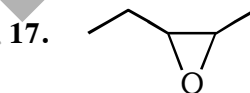
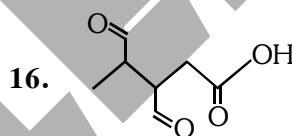
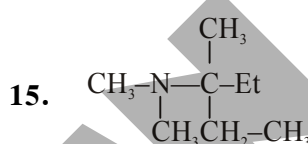
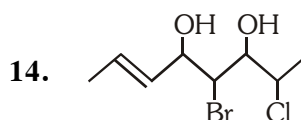
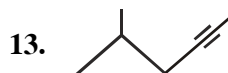
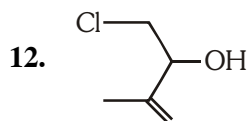
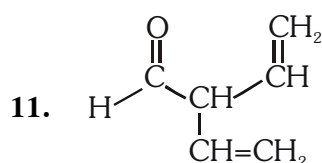
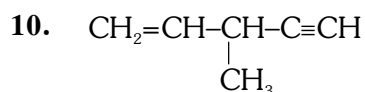
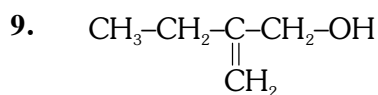
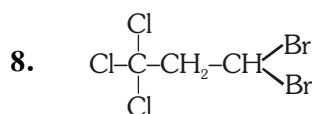
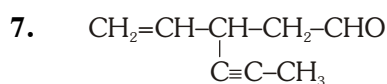
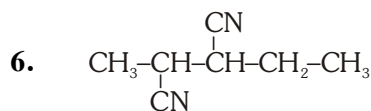
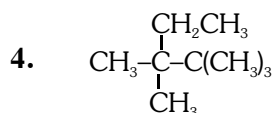
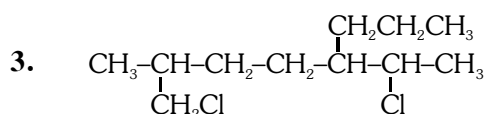
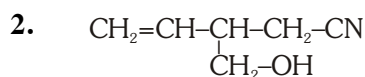
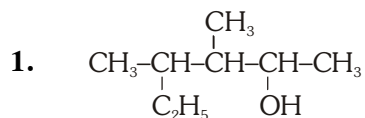
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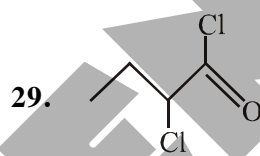
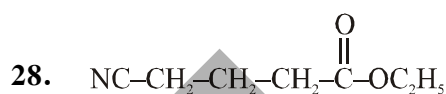
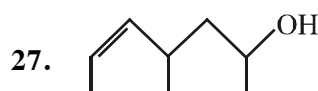
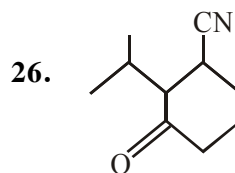
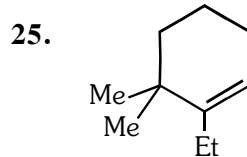
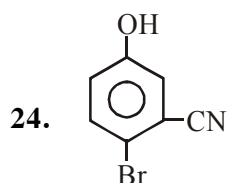
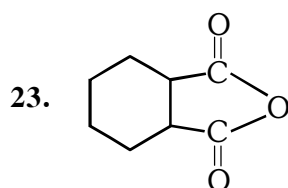
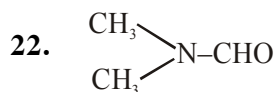
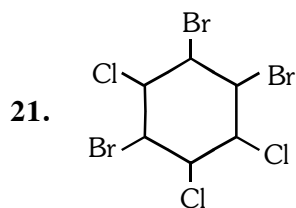
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IUPAC SYSTEM

RACE # 01

Write down the IUPAC names of the following compounds :-





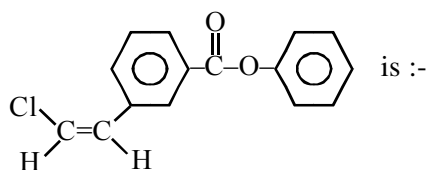
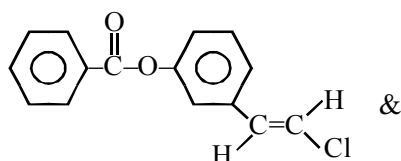
ANSWER KEY

- | | |
|---|---|
| 1. 3,4-Dimethylhexan-2-ol | 16. 3-Formyl-4-methyl-5-oxo pentanoic acid |
| 2. 3-(Hydroxymethyl) pent-4-ene-1-nitrile | 17. 2, 3-Epoxy pentane |
| 3. 1-Chloro-5-(1'-chloroethyl)-2-methyloctane | 18. Cyclopentanecarboxamide |
| 4. 2, 2, 3, 3-Tetramethylpentane | 19. 1,3-Dibromo-2-chloro cycloprop-1-ene |
| 5. Ethyl-3-isocyanobutanoate | 20. 2-Ethyl-1, 1-dimethylcyclopropane |
| 6. 2-Ethyl-3-methylbutanedinitrile | 21. 1, 2, 4-Tribromo-3, 5, 6-trichlorocyclohexane |
| 7. 3-Ethenyl hex-4-yn-1-al | 22. N, N-Dimethylmethanamide |
| 8. 3,3-Dibromo-1,1,1-trichloropropane | 23. Cyclohexane-1, 2-dicarboxylic anhydride |
| 9. 2-Ethylprop-2-en-1-ol | 24. 2-Bromo-5-hydroxy benzene carbonitrile |
| 10. 3-Methylpent-1-en-4-yne | 25. 1-Ethyl-6,6-dimethyl-1-cyclohexene |
| 11. 2-Ethenylbut-3-enal | 26. 3-Isopropyl-2-methyl-4-oxo hexane nitrile |
| 12. 1-Chloro-3-methylbut-3-en-2-ol | 27. 4-Methylhept-5-en-2-ol |
| 13. 5-Methyl hex-2-yne | 28. Ethyl-4-cyanobutanoate |
| 14. 4-Bromo-2-chloro oct-6-en-3,5-diol | 29. 2-Chlorobutanoylchloride |
| 15. N, N, 3-Trimethyl pentan-3-amine | 30. 2-Ethyl-4-oxobutanenitrile |

STRUCTURAL ISOMERISM

RACE # 02

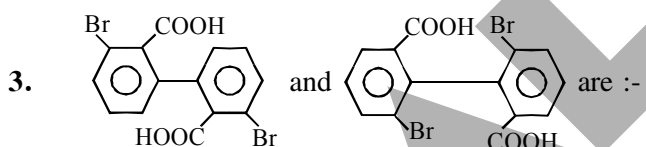
1. Isomerism shown by the following compounds



- (1) Functional group isomerism
(2) Geometrical isomerism
(3) Metamerism
(4) Position isomerism

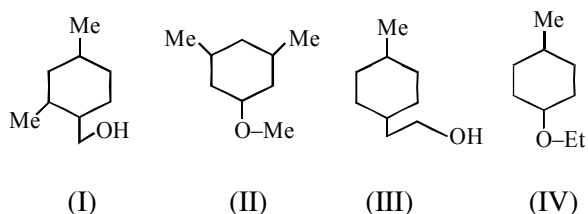
2. How many structural isomers are possible when one H-atom of anthracene is replaced by chlorine :-

- (1) 3 (2) 7 (3) 4 (4) 6



- (1) Chain isomers (2) Geometrical isomers
(3) Functional isomers (4) Position isomers

4. Which of the following is not the correct relationship :



- (1) I and IV are positional isomers
(2) I and II are functional isomers
(3) I and III are chain isomers
(4) II & IV are metamers

5. How many amines are possible with the molecular formula $C_4H_{11}N$ (structural isomers only) :-

- (1) 6 (2) 7 (3) 8 (4) 9

6. How many benzenoid isomers are possible for M.F. C_7H_8O :-

- (1) 3 (2) 4 (3) 5 (4) 6

7. How many total structural isomers of 3° amines are possible with the molecular formula $C_6H_{15}N$

- (1) 4 (2) 7 (3) 6 (4) 5

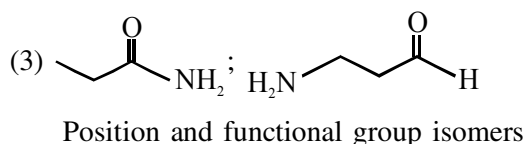
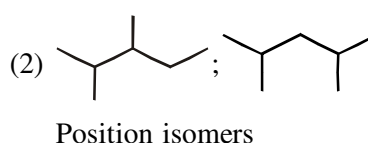
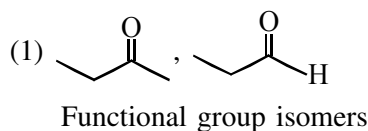
8. Only two isomeric monochloro derivatives are possible for (excluding stereo) :-

- (1) n-Butane
(2) 2,2-Dimethylpentane
(3) Benzene
(4) Neopentane

9. How many alkenes (only structural isomers) are possible with the molecular formula C_4H_8

- (1) 4 (2) 3 (3) 5 (4) 6

10. Which of the following is correct :-



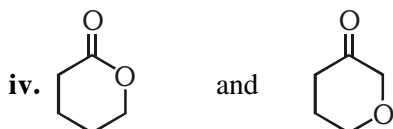
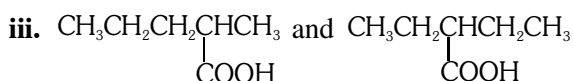
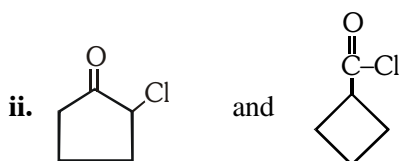
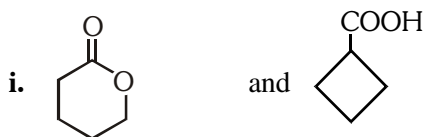
- (4) All of these

11. Branched chain isomer of a hydrocarbon having molecular mass 72u gives only one isomeric alkyl halide after monosubstitution. The hydrocarbon is :-

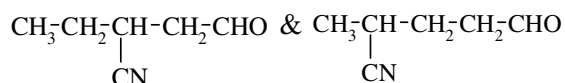
- (1) neohexane (2) t-butyl chloride
(3) neopentane (4) isooctane

12. How many structural isomers are possible of $C_5H_{12}O$:-
 (1) 5 (2) 8 (3) 13 (4) 14

13. Find out relation between the following compounds:



14. What is relation between following compounds



- (1) positional isomers (2) chain isomers
 (3) optical isomers (4) metamers

15. No. of structural isomeric alkenes (molecular formula = C_6H_{12}) which all give n-hexane on hydrogenation in presence of metal catalyst

- (1) 2 (2) 3 (3) 4 (4) 5

16. How many isomeric geminal dihalides are possible for the compound having M.F. $C_3H_6Cl_2$

- (1) 1 (2) 2
 (3) 3 (4) 4

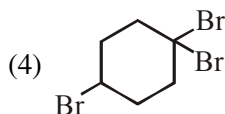
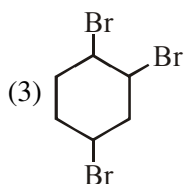
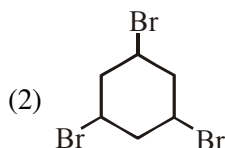
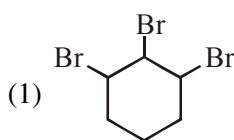
ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10
Ans	3	1	4	1	3	3	2	1	2	2
Que.	11	12	13					14	15	16
Ans	3	4	(i) F.G.I. (ii) F.G.I. (iii) C.I. (iv) F.G.I.					2	2	2

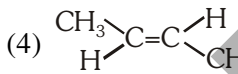
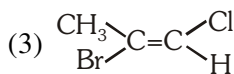
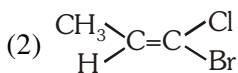
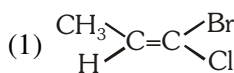
GEOMETRICAL ISOMERISM

RACE # 03

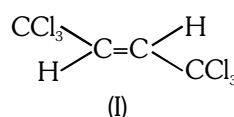
1. Which of the following compounds does not have any geometrical isomer ?



2. Which one of the following is a Z isomer ?

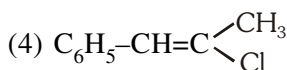
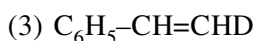
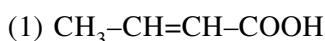


3. Which is true for the following isomeric forms I & II respectively :



Dipole moment	Boiling point	Melting point	Stability
(1) I > II	I > II	II > I	I > II
(2) II > I	II > I	II > I	II > I
(3) I > II	I > II	I > II	I > II
(4) II > I	II > I	I > II	I > II

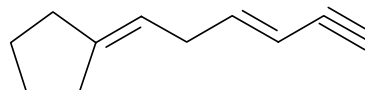
4. In which compound cis-trans nomenclature cannot be used :



5. The compound $\text{CH}_3\text{-C(Cl)=C-I}$ is :-

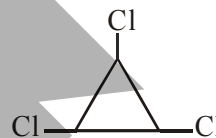
(1) trans (2) cis (3) Z (4) E

6. How many geometrical isomers are possible for the given compound



(1) 2 (2) 4 (3) 6 (4) 8

7. How many geometrical isomers are possible for



(1) 0 (2) 1 (3) 2 (4) 3

8. Which of the following compounds can show geometrical isomerism :

(i) Pent-3-en-1-yne

(ii) Acetaldoxime

(iii) Pent-1-ene

(iv) 1-chloropropene

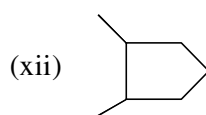
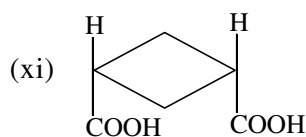
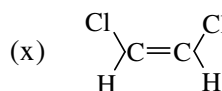
(v) 2-Methylbut-2-ene

(vi) But-2-yne

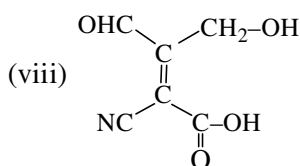
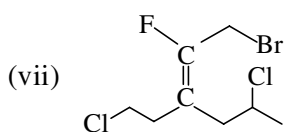
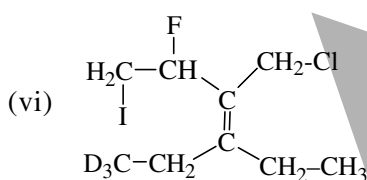
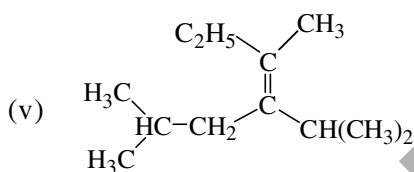
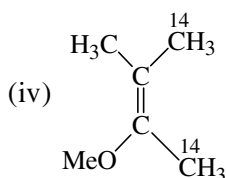
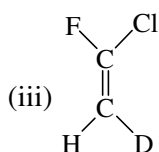
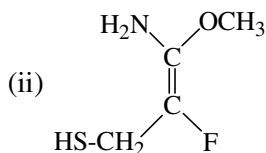
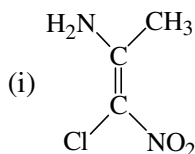
(vii) 2-chlorobutane

(viii) Butenyne

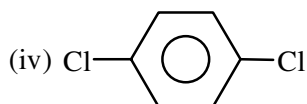
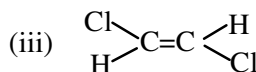
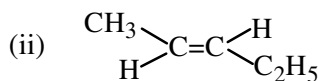
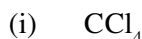
(ix) $\text{CH}_3\text{-CH=CH-CH}_3$



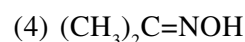
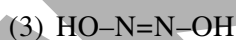
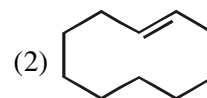
9. Assign the configuration E/Z to the following compounds.



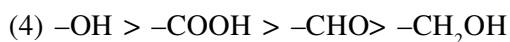
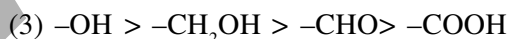
10. Which of the following compounds have zero dipole moment.



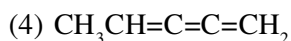
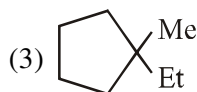
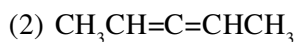
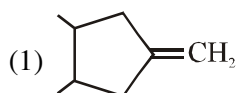
11. Which will not show G.I. ?



12. According to CIP sequence rules the correct order of priority for the given groups is



13. GI is shown by :



ANSWER KEY

Que.	1	2	3	4	5	6	7	8
Ans	4	1	4	4	4	1	3	i, ii, iv, ix, x, xi, xii
Que.	9			10		11	12	13
Ans	Z-i, ii, iii, - E- iv, v, vi, vii, viii			i & iii, iv		4	4	1

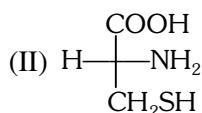
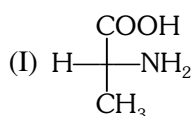
OPTICAL ISOMERISM

RACE # 04

1. Which of the following will have a meso-isomer also :-

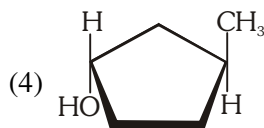
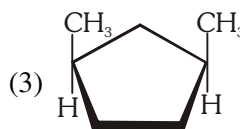
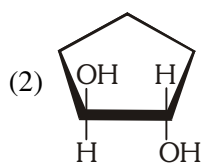
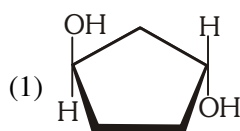
- (1) 2-Chlorobutane
(2) 2,3-Dichlorobutane
(3) 2,3-Dichloropentane
(4) 2-Hydroxy butanoic acid

2. The correct absolute configuration assigned for compound (I) and (II) respectively is :



- (1) R, R (2) R, S
(3) S, S (4) S, R

3. Which of the following cyclopentane derivative is optically inactive ?

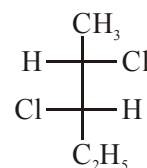


4. Match Column - I with Column - II and select the correct answer using the codes given below :

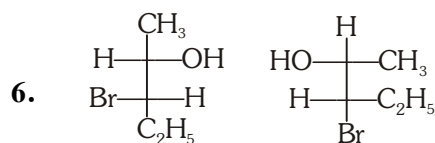
Column - I		Column - II	
(A)	Constitutional	(P)	Stereoisomers that are not mirror image isomer
(B)	Stereoisomers	(Q)	Isomers that have same constitution but differ in the arrangement of their atoms in space
(C)	Enantiomers	(R)	Isomers that differ in the order in which their atoms are connected
(D)	Diastereoisomers	(S)	Stereoisomers that are related as an object and its non superimposable mirror image

- (1) A-P, B-Q, C-S, D-R
(2) A-P, B-Q, C-R, D-S
(3) A-R, B-Q, C-S, D-P
(4) A-R, B-Q, C-P, D-S

5. The absolute configuration of the following compound is :-



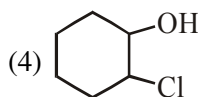
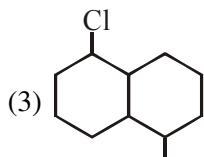
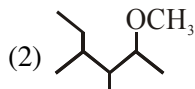
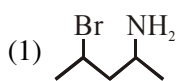
- (1) 2S, 3R (2) 2S, 3S
(3) 2R, 3S (4) 2R, 3R



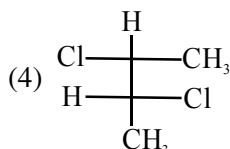
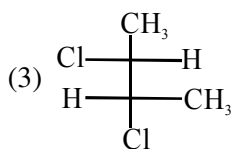
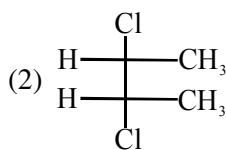
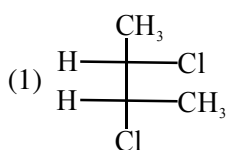
The molecules represented by the above two structures are :

- (1) identical (2) enantiomers
(3) diastereomers (4) epimers

7. The compound which has maximum number of chiral carbon is :-



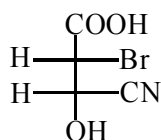
8. Which of the following structure does not represent meso isomer :-



9. & are :-

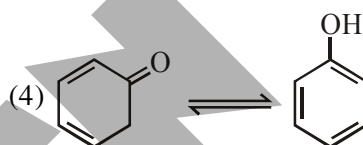
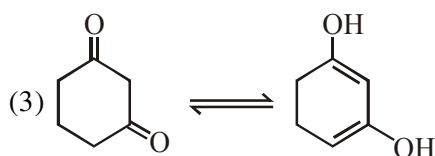
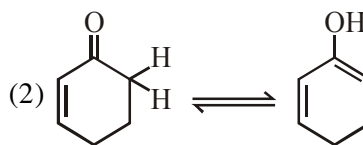
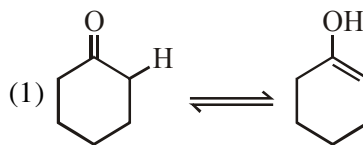
- (1) Identical
(2) Enantiomers
(3) Diastereomers
(4) Positional isomers

10. Configurations of the two centres in the following molecule are :

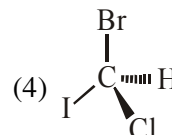
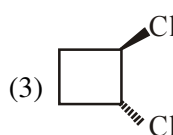
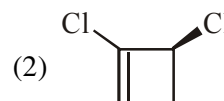
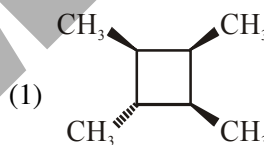


- (1) (2R, 3S) (2) (2R, 3R)
(3) (2S, 3S) (4) (2S, 3R)

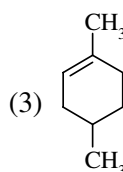
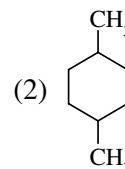
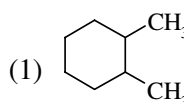
11. Which have most stable enol form :-



12. In which of the following compound have plane of symmetry ?



13. Which of the following compound will not show optical isomerism



- (4) all of these

ANSWER KEY

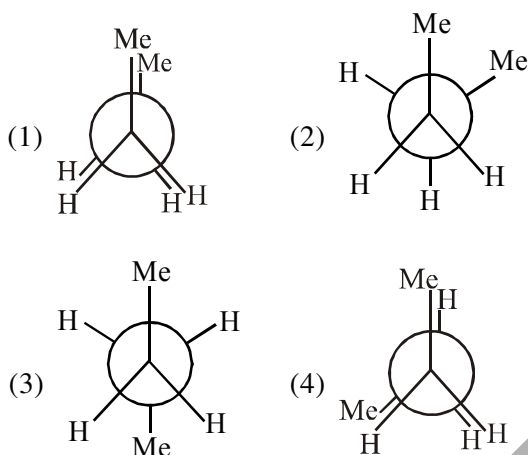
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans	2	2	3	3	2	1	3	1	1	1	4	1	2

ISOMERISM (COMPLETE)

RACE # 05

- A compound of molecular formula C_7H_{16} shows optical isomerism, compound will be :-
 (1) 2,3-Dimethyl pentane
 (2) 2,2-Dimethyl butane
 (3) 2-Methyl hexane
 (4) None of above

- Which is the highest energy conformation of butane :-

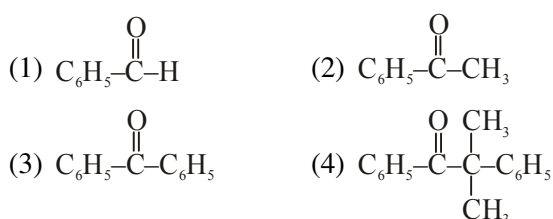


- Which conformer of the given compound is most stable (rotation about C-C bond) :-
 $HO-CH_2-CH_2-NO_2$

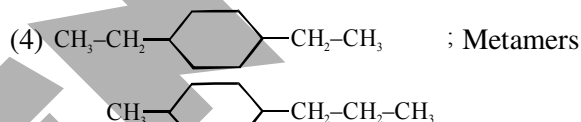
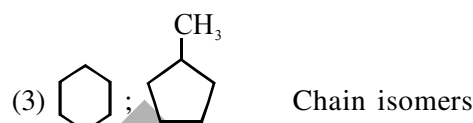
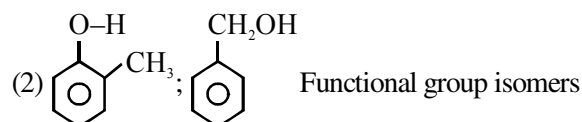
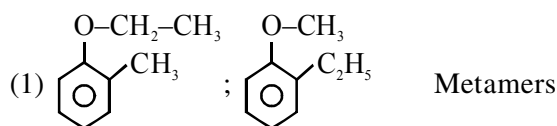
- (1) Staggered
- (2) Gauche
- (3) Fully eclipsed
- (4) Partially eclipsed

- Which of the following statement is true :-
 (1) Compound having chiral-C essentially shows optical isomerism
 (2) Compound having one chiral-C can not have meso isomer
 (3) Chiral molecule may or may not have chiral-C
 (4) All

- Keto-enol tautomerism is observed in:-



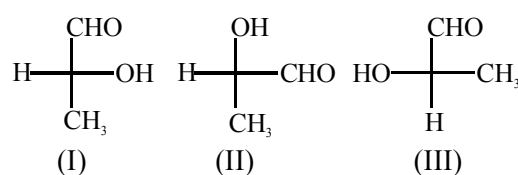
- Which of the following is incorrectly matched:-



- Sum of X, Y and Z is :-

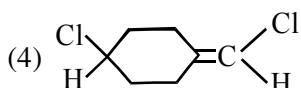
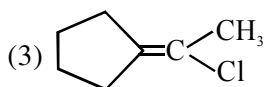
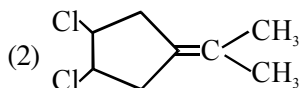
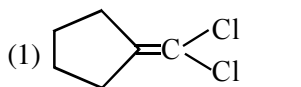
- C_4H_8O No. of aldehydes = X
 - C_5H_{12} No. of chain isomers = Y
 - C_4H_8 Maximum no. of alkenes = Z
- (1) 10 (2) 7 (3) 9 (4) 8

- Which of the following is false for the given molecules :-

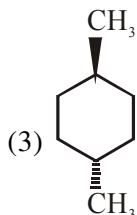
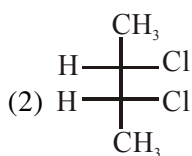
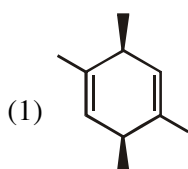


- (1) Equimolecular mixture of I and II does not show optical activity
- (2) II and III have different behaviour towards PPL
- (3) II & III are identical
- (4) I & II can not be separated by fractional distillation method from their mixture.

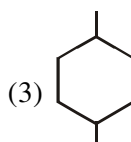
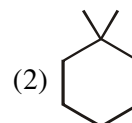
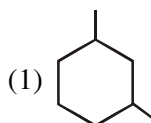
9. Which of the following compounds can show geometrical isomerism :-



10. Which of following compound is chiral

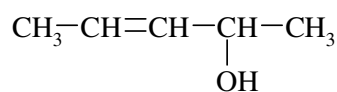


11. Which one of following isomer has meso isomer ?



(4) All of these

12. Number of stereoisomers of the given compound is

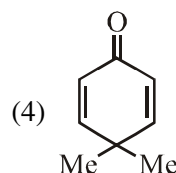
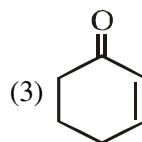
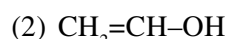


(1) 2 (2) 3 (3) 4 (4) 6

13. Which of the following has the most acidic hydrogen :-

(1) 3-hexanone (2) 2,4-hexanedione
(3) 2,5-hexanedione (4) 2,3-hexanedione

14. Which of the following compound can not show tautomerism ?



ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Ans	1	1	2	4	2	4	3	3	2	1	1	3	2	4	

ELECTRONIC DISPLACEMENT

RACE # 06

Reconcile the concept :

- ❑ Carbocation i.e. carbon bearing positive charge.
- ❑ Carbocation are stabilized by +I effect and destabilized by -I effect.
- ❑ As +I effect tends to disperse the +ve charge, more the dispersion of +ve charge more will be stabilization of carbocation.
- ❑ -I effect tends to intensify the charge on $C^{\oplus}$ (carbocation), more the intensification of charge more will be destabilization of carbocation.
- ❑ Carbanion i.e. carbon bearing -ve charge.
- ❑ -I effect tends to disperse the -ve charge thus stabilized the carbanion.
- ❑ +I effect tends to intensify the -ve charge thus destabilized the carbanion.
- ❑ -I effect : $-\overset{\oplus}{O}R_2 > -\overset{\oplus}{N}R_3 > -\overset{\oplus}{N}H_3 > -NO_2 > -CN > -COOH > \text{Halogens} > -OR > -OH > -C \equiv CH > -NH_2 > -Ph > CH_2 = CH -$
- ❑ +I effect: $-\overset{\ominus}{N}H > -\overset{\ominus}{O} > (CH_3)_3C- > (CH_3)_2CH- > CH_3-CH_2- > -CD_3 > -CH_3 > -D > -H$

1. The order of the -I effect orbitals in :

- (1) $sp^3 > sp^2 > sp$
- (2) $sp^2 > sp^3 > sp$
- (3) $sp > sp^2 > sp^3$
- (4) $sp^3 > sp > sp^2$

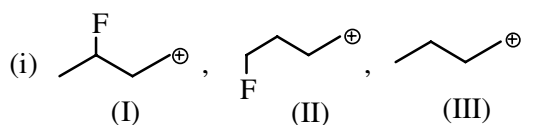
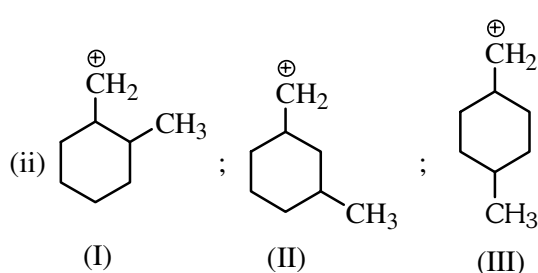
2. The number of electron present in the valence shell of carbon of carbanion bearing -ve charge

- (1) 8 (2) 7 (3) 6 (4) 4

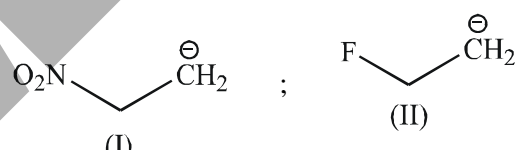
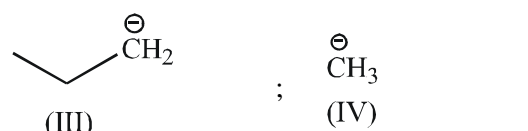
3. Arrange the following in the stability order :

- (I) $CH_3-C \equiv C^{\ominus}$ (II) $CH_3-CH=CH^{\ominus}$
 (III) $CH_3-\overset{\ominus}{C}H-CH_3$ (IV) $CH_3-CH_2-\overset{\ominus}{C}H_2$

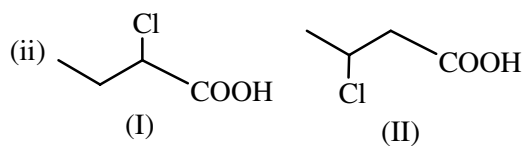
4. Arrange given carbocations in decreasing order of their stability:

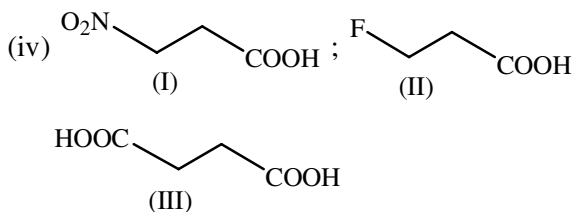
- (i)  (I) (II) (III)
- (ii)  (I) (II) (III)

5. Arrange given anions in decreasing order of their stability

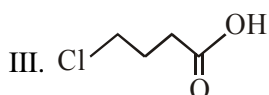
-  (I) (II)
-  (III) (IV)

6. Arrange given compounds in decreasing order of their K_a value:

- (i) $HCOOH$; CH_3COOH ; C_2H_5COOH ;
 (I) (II) (III)
- C_3H_7-COOH
 (IV)
- (ii)  (I) (II)
-  (III)
- (iii) $HOOC-CH_2-CH_2-COOH$; $HOOC-CH_2-COOH$
 (I) (II)
- $HOOC-COOH$
 (III)



7. Which of the following acid has maximum K_a :



- (1) II (2) III
(3) I (4) None of these

8. Arrange the compounds in order of decreasing acidity :

- (I) $\text{ClCH}_2-\text{CH}_2-\text{OH}$
(II) $\text{Cl}_2\text{CH}-\text{CH}_2-\text{OH}$
(III) $\text{Cl}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{OH}$
(IV) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{OH}$

- (1) I > II > III > IV (2) IV > III > II > I
(3) II > I > IV > III (4) II > I > III > IV

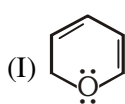
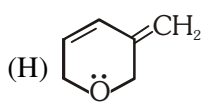
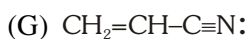
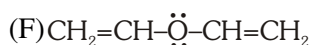
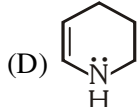
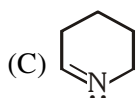
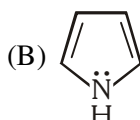
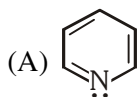
9. Consider the given compounds :

- (1) $\text{CH}_3-\text{CH}_2-\text{NH}_2$ (2) $\text{CH}_3-\text{CH}=\text{NH}$
(3) $\text{CH}_3-\text{C}\equiv\text{N}$ (4) $\text{C}_2\text{H}_5-\text{NH}-\text{C}_2\text{H}_5$

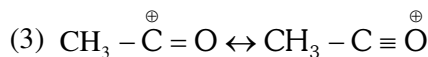
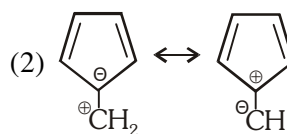
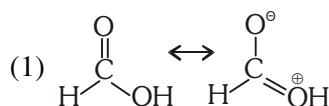
Arrange basicity of these compounds in decreasing order :

- (1) 4 > 1 > 2 > 3 (2) 1 > 2 > 3 > 4
(3) 1 > 4 > 2 > 3 (4) 4 > 1 > 3 > 2

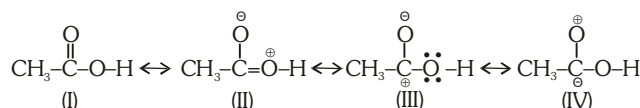
10. In which of the following cases lone-pair is involved in resonance :



11. Identify more stable canonical structure :



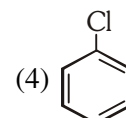
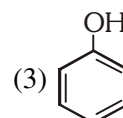
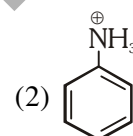
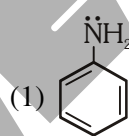
12. Acetic acid is considered as resonance hybrid



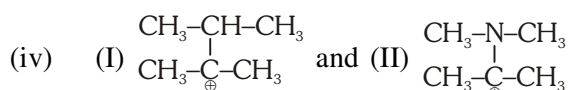
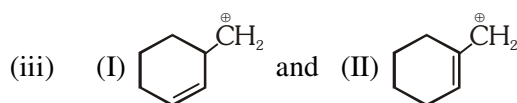
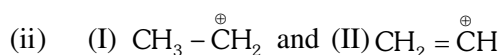
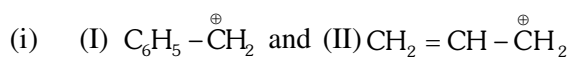
Which of the following order is correct for the stability of four contributing structure :

- (1) I > II > III > IV (2) I > II > IV > III
(3) I > III > II > IV (4) I > IV > III > II

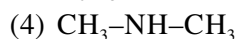
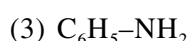
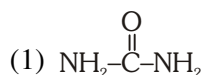
13. In which of the following molecule group present on ring is not involved in resonance :



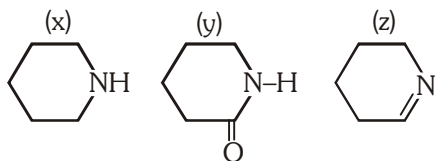
14. In each of the following pairs of ions which ion is more stable :



15. Among the following compounds, the strongest base is :

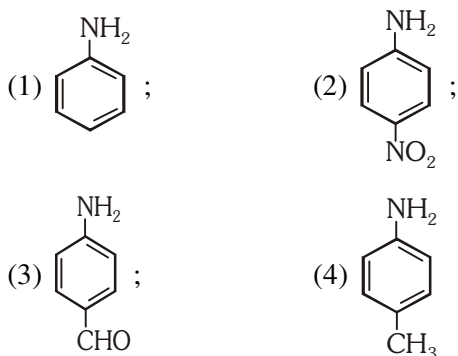


16. The correct order of decreasing basic strengths of x, y and z is :



- (1) $x > y > z$ (2) $x > z > y$
(3) $y > x > z$ (4) $y > z > x$

17. Consider the following compounds :



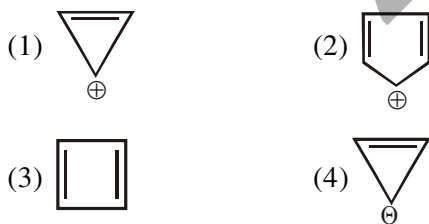
Arrange these compounds in decreasing order of their basicity :

- (1) $1 > 2 > 3 > 4$ (2) $2 > 3 > 1 > 4$
(3) $4 > 1 > 3 > 2$ (4) $4 > 1 > 2 > 3$

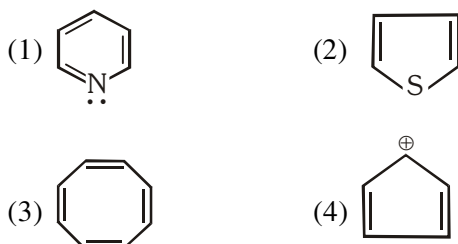
18. Which shows aromatic character :



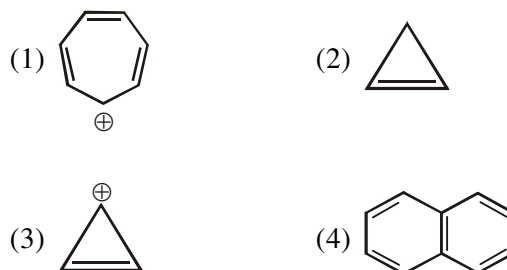
19. Among the following the aromatic compound is



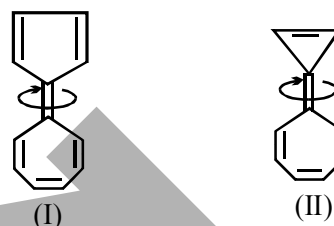
20. Which of the following is anti-aromatic species :



21. Which of the following is non-aromatic :

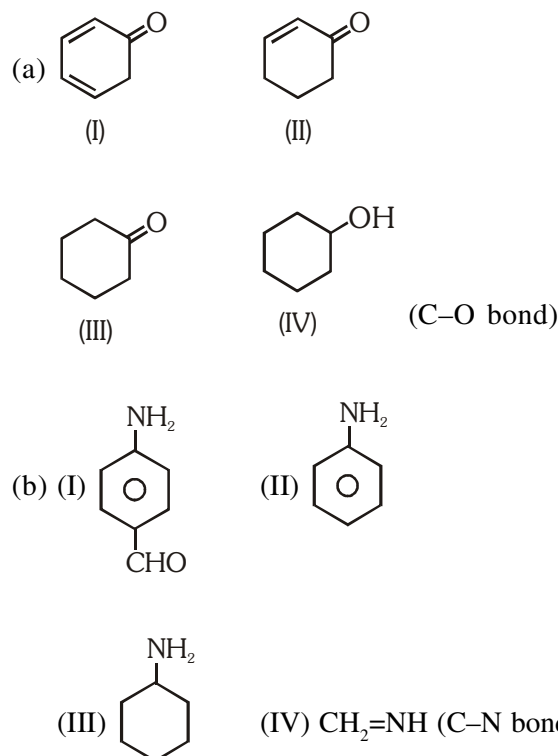


22. Compare C-C bond rotation in the following molecules :-

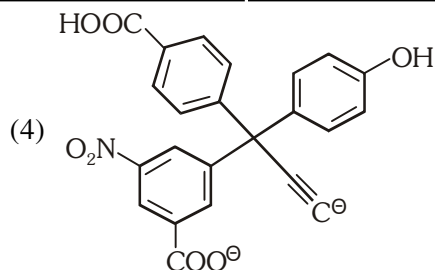
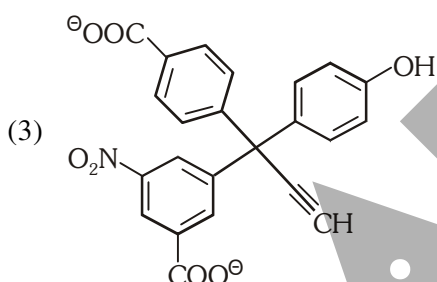
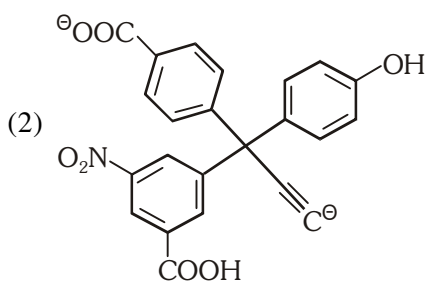
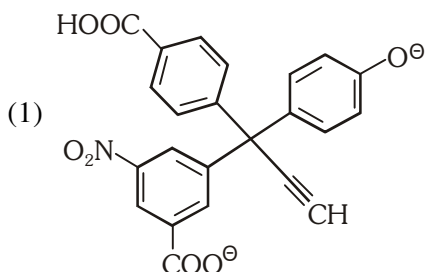
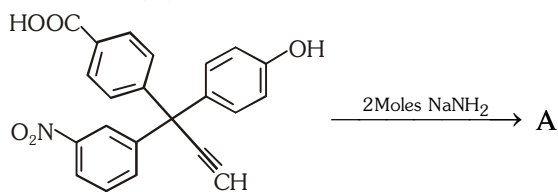


- (1) $I > II$
(2) $II > I$
(3) $I = II$
(4) can not be compared

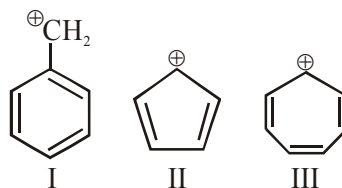
23. What is the order of indicated bond length for the following set of molecules :



24. Product (A) will be :-



25. Which of the following represents the correct order of stability of the given carbocations ?



- (1) III > I > II (2) I > III > II
(3) III > II > I (4) II > III > I

26. Which of the following group has maximum hyperconjugation effect but minimum inductive effect

- (1) $-\text{CH}_3$ (2) $-\text{CH}_2-\text{CH}_3$
(3) $-\text{CD}_3$ (4)

27. Arrange in decreasing order of basic strength:-
 CH_3CO_2^- $\text{CH}_3\text{CH}_2\text{O}^-$ CH_3SO_3^-

- A B C
(1) C > A > B (2) A > B > C
(3) B > A > C (4) A > C > B

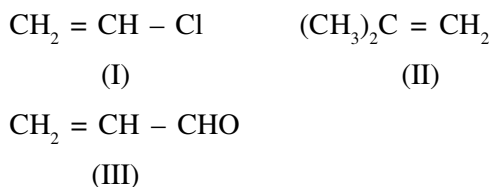
ANSWER KEY

Que.	1	2	3	4		5				
Ans	3	1	I > II > IV > III		(i) III > II > I (ii) I > II > III		(i) I > II > IV > III			
Que.	6					7	8	9		
Ans	(i) I > II > III > IV (ii) I > II > III (iii) III > II > I (iv) I > III > II					3	4	1		
Que.	10	11			12	13	14			
Ans	B,D,F,I	(1) I > II (2) I > II (3) II > I			1	2	(i) I > II (ii) I > II (iii) II > I (iv) II > I			
Que.	15	16	17	18	19		20		21	22
Ans	2	2	3	2	1		4		2	1
Que.	23					24	25	26	27	
Ans	(a) IV > I > II > III (b) III > II > I > IV					3	1	1	3	

REACTION MECHANISM (PART-II)

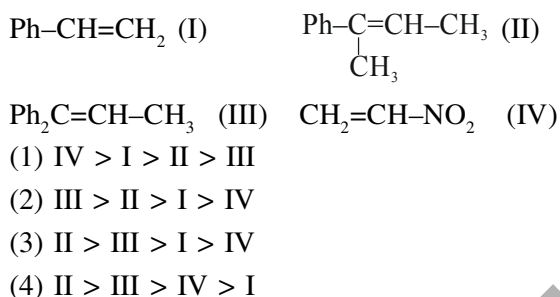
RACE # 07

1. Reactivity order of the following compounds for hydrochlorination (HCl) is



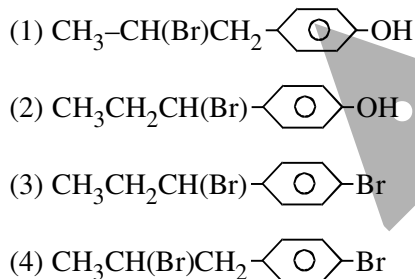
- (1) I > II > III (2) II > III > I
(3) II > I > III (4) III > I > II

2. Arrange the following compounds in decreasing order of reactivity for EAR :-



3. $\text{CH}_3-\text{CH}=\text{CH}-\text{C}_6\text{H}_4-\text{OH} \xrightarrow{\text{H}-\text{Br}}$ **A** (major product)

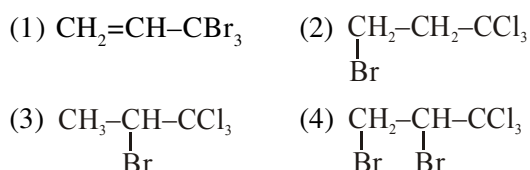
A is :-



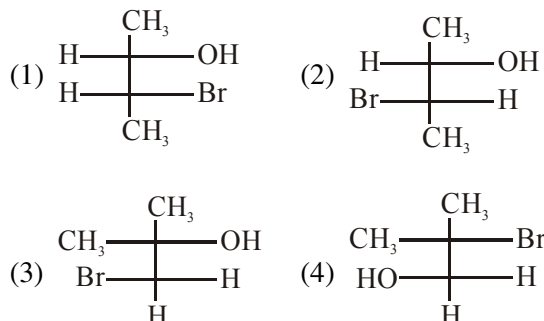
4. Ethylene reacts with Br_2 water in presence of NaCl, gives -

- (1) 1,2-Dibromoethane
(2) 2-Bromoethanol
(3) 1-Bromo-2-Chloroethane
(4) All of these

5. $\text{CH}_2=\text{CH}-\text{CCl}_3 \xrightarrow{\text{HBr}}$?



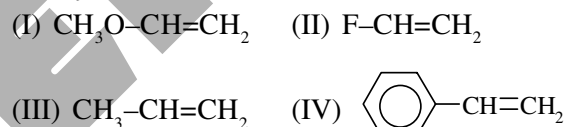
6. Trans-2-butene $\xrightarrow{\text{HOBr}}$ P.
Identify the product P



7. $\text{CH}_2=\text{CH}-\text{C}\equiv\text{CH} \xrightarrow[1 \text{ eq.}]{\text{HCl}}$ P $\xrightarrow{\text{polymerisation}}$ Q.
Product Q is :-

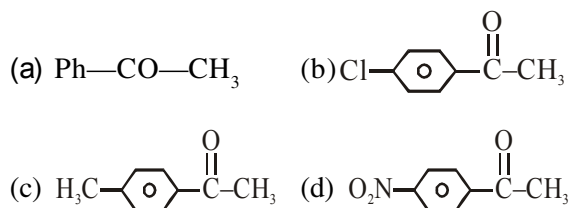
- (1) Chloroprene (2) Natural rubber
(3) Buna-S (4) Neoprene

8. Arrange the following towards their reactivity for hydration?



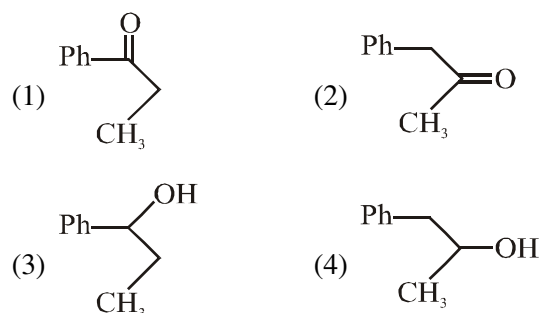
- (1) II > I > III > IV (2) I > III > IV > II
(3) I > II > III > IV (4) I > IV > III > II

9. Arrange the following compounds in decreasing order of K_{eq} for nucleophilic addition reaction.

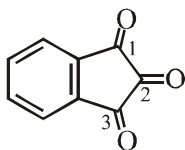


- (1) a > b > c > d (2) c > a > b > d
(3) d > b > a > c (4) d > a > b > c

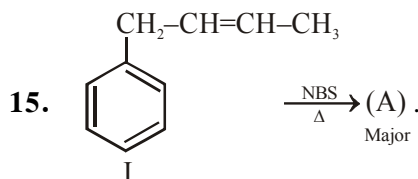
10. $\text{Ph}-\text{C}\equiv\text{C}-\text{CH}_3 \xrightarrow[\text{dil. H}_2\text{SO}_4]{\text{Hg}^{+2}}$, Product will be :-



11. Which carbonyl group of the given compound is most reactive for hydration :-



- (1) 3
(2) 1
(3) 2
(4) All have equal reactivity
12. Select the chain propagation steps in the free radical chlorination of methane :-
- (a) $\text{Cl}_2 \longrightarrow 2\dot{\text{Cl}}$
(b) $\dot{\text{Cl}} + \text{CH}_4 \longrightarrow \text{CH}_3\dot{\text{C}}\text{H} + \text{H}\dot{\text{Cl}}$
(c) $\dot{\text{Cl}} + \text{CH}_4 \longrightarrow \dot{\text{C}}\text{H}_3 + \text{HCl}$
(d) $\dot{\text{H}} + \text{Cl}_2 \longrightarrow \text{HCl} + \dot{\text{Cl}}$
(e) $\dot{\text{C}}\text{H}_3 + \text{Cl}_2 \longrightarrow \text{CH}_3\dot{\text{C}}\text{H} + \dot{\text{Cl}}$
- (1) b, c, e
(2) a, c, e
(3) c, e
(4) b, c, d
13. A hydrocarbon X (V.D.=35) forms only one monochloro substitution product, X is :-
- (1) Neopentane
(2) Cyclopentane
(3) Pent-1-ene
(4) n-pentane
14. Propene heated with Cl_2 at 600°C gives -
- (1) 1,2-Dichloropropane
(2) 1-Chloropropene
(3) 3-Chloropropene
(4) 2-Chloropropene



Compound (A) is :

- (1) $\text{Ph}-\text{CH}_2-\text{CH}=\text{CH}-\text{CH}_2\text{Br}$
(2) $\text{Ph}-\underset{\text{Br}}{\text{CH}}-\text{CH}=\text{CH}-\text{CH}_3$
(3) $\text{Ph}-\text{CH}_2-\text{CH}_2-\underset{\text{Br}}{\text{CH}}-\text{CH}_3$
(4) $\text{Ph}-\text{CH}_2-\underset{\text{Br}}{\text{CH}}-\text{CH}_2-\text{CH}_3$

16. Match column-I and column-II and select the answer :

Column-I		Column-II	
(a)	$\text{CH}_3-\text{CH}=\text{CH}_2 \xrightarrow{?} \text{CH}_3-\underset{\text{Br}}{\text{CH}}-\text{CH}_3$	(p)	HBr followed by hydrolysis
(b)	$\text{CH}_3-\text{CH}=\text{CH}_2 \xrightarrow{?} \text{CH}_2-\underset{\text{Br}}{\text{CH}}=\text{CH}_2$	(q)	Br_2/CCl_4
(c)	$\text{CH}_3-\text{CH}=\text{CH}_2 \xrightarrow{?} \text{CH}_3-\underset{\text{Br}}{\text{CH}}-\underset{\text{Br}}{\text{CH}}_2$	(r)	NBS
(d)	$\text{CH}_3-\text{CH}=\text{CH}_2 \xrightarrow{?} \text{CH}_3-\underset{\text{OH}}{\text{CH}}-\text{CH}_3$	(s)	HBr

- (1) (a-s), (b-r), (c-q), (d-p)
(2) (a-p), (b-r), (c-q), (d-s)
(3) (a-s), (b-q), (c-r), (d-p)
(4) (a-q), (b-r), (c-s), (d-p)

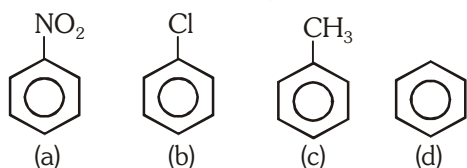
ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans	3	2	2	4	2	1	4	4	3	1	3	3	2	3	2
Que.	16														
Ans	1														

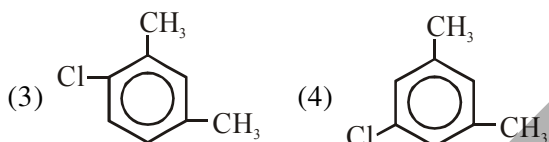
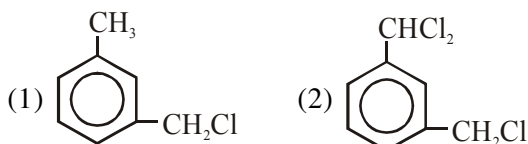
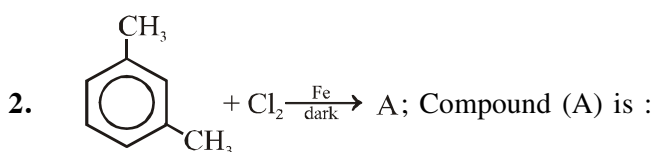
REACTION MECHANISM (PART-II)

RACE # 08

1. Correct order of rate of EAS (electrophilic aromatic substitution) ?

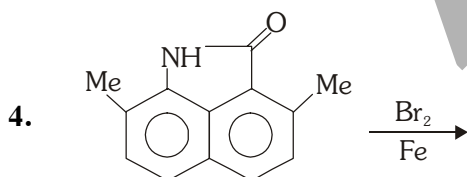


- (1) $c > b > a > d$ (2) $c > d > a > b$
(3) $a > b > c > d$ (4) $c > d > b > a$

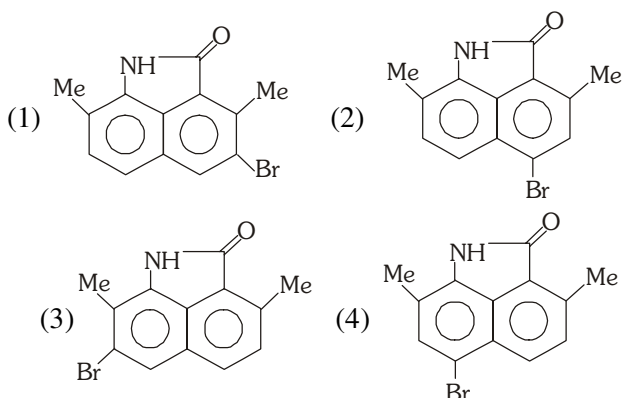


3. Which of following would not give 2-phenyl butane as the major product in a Friedel Crafts alkylation reaction with benzene?

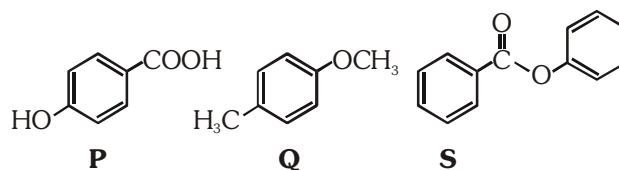
- (1) Butanoyl chloride + AlCl_3 then Zn-Hg/HCl
(2) n-Butyl chloride + AlCl_3
(3) 2-Butanol + H_2SO_4
(4) 1-Butene + HF



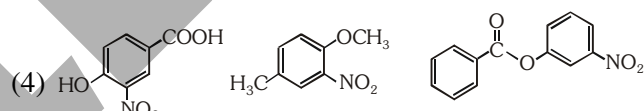
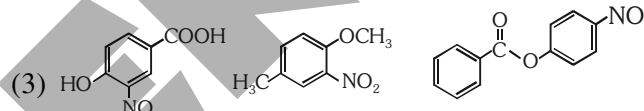
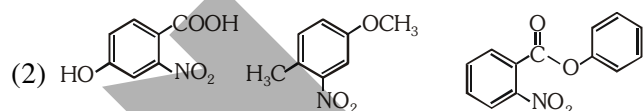
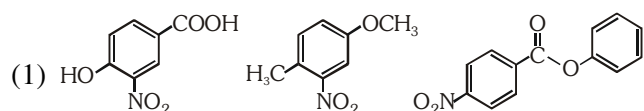
Major product of above reaction is :



5. The compounds P, Q and S



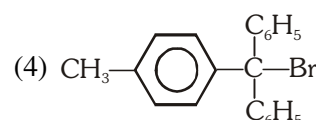
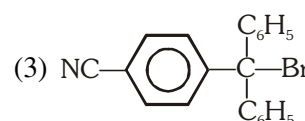
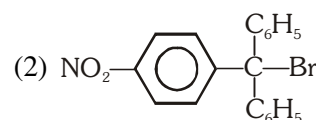
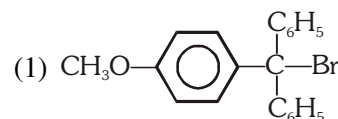
were separately subjected to nitration using $\text{HNO}_3/\text{H}_2\text{SO}_4$ mixture. The major product formed in each case respectively, is -



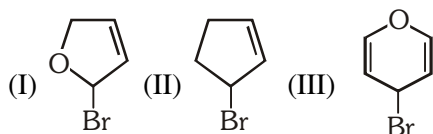
6. The order of reactivity of the following alkyl halides for a $\text{S}_\text{N}2$ reaction is -

- (1) $\text{RF} > \text{RCl} > \text{R-Br} > \text{R-I}$
(2) $\text{R-F} > \text{R-Br} > \text{R-Cl} > \text{R-I}$
(3) $\text{R-Cl} > \text{R-Br} > \text{R-F} > \text{R-I}$
(4) $\text{R-I} > \text{R-Br} > \text{R-Cl} > \text{R-F}$

7. Which one of the following is most reactive for $\text{S}_\text{N}1$ reaction :

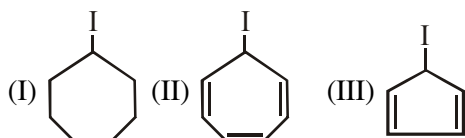


8. Among the bromides given below, the order of reactivity of S_N1 reaction is -



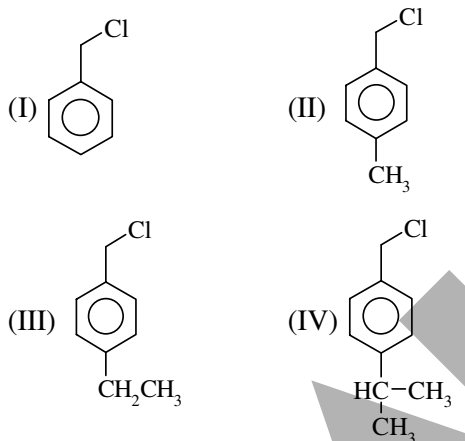
- (1) III > I > II (2) III > II > I
(3) II > III > I (4) II > I > III

9. Compare rate of S_N1 :-



- (1) II > III > I (2) II > I > III
(3) I > II > III (4) III > II > I

10. Reactivity order for S_N1 reaction

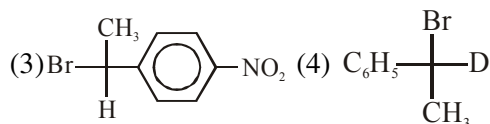
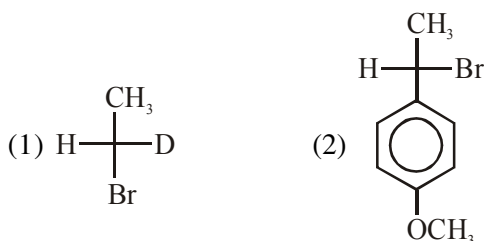


- (1) I > II > III > IV (2) II > III > IV > I
(3) IV > III > II > I (4) III > IV > II > I

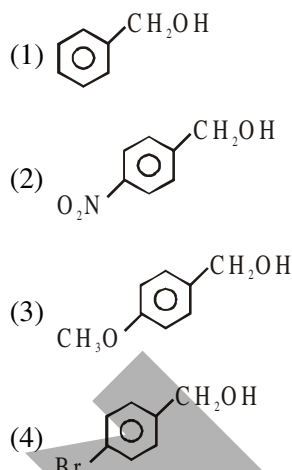
11. A carbocation gives reaction except :-

- (1) Addition with nucleophile
(2) Rearrange to give more stable carbocation
(3) Rearrange to give less stable carbocation
(4) Deprotonation to give C=C

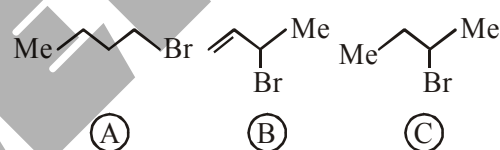
12. Under identical conditions, solvolysis of which of the following substrate would lead to maximum racemisation :-



13. Which of the following alcohols is most reactive towards substitution with HBr ?



14. Consider the following bromides :-

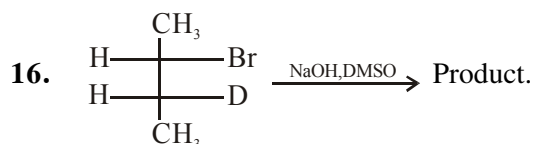


The correct order of S_N1 reactivity is

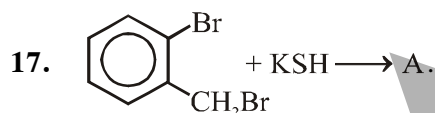
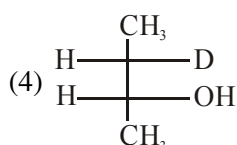
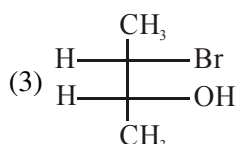
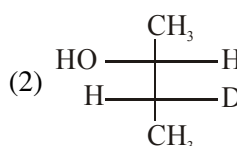
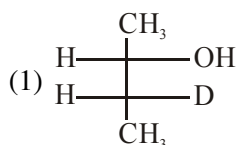
- (1) A > B > C (2) B > C > A
(3) B > A > C (4) C > B > A

15. Of the following statements which are true for S_N1 reaction.

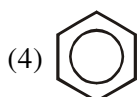
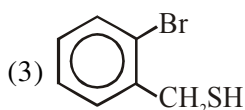
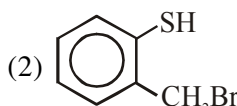
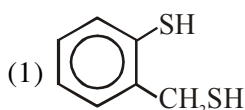
- (a) Tertiary alkyl halides react faster than secondary.
(b) The absolute configuration of the product is opposite to that of the reactant when an optical active substrate is used.
(c) The reaction shows first order kinetics.
(d) The rate of reaction depends markedly on the nucleophilicity of the nucleophile.
(e) The mechanism is two step.
(f) Carbocations are intermediate.
(g) Rate $\propto$ [Alkyl halides]
(h) The rate of the reaction depends on the nature of the leaving group.



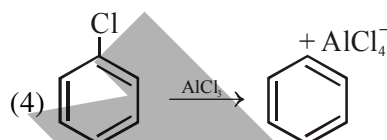
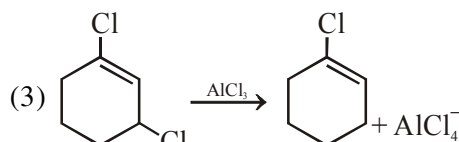
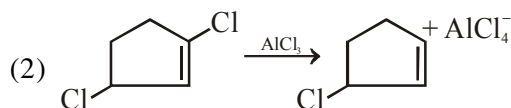
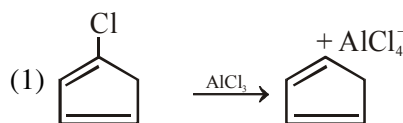
Productis :-



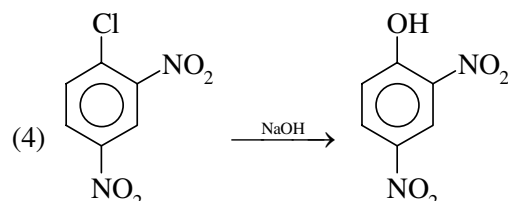
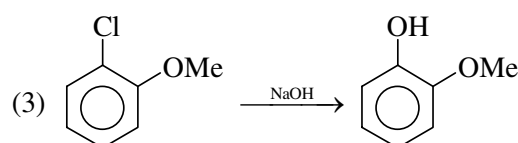
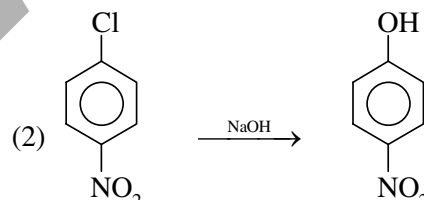
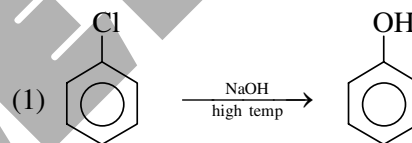
Compound (A) is



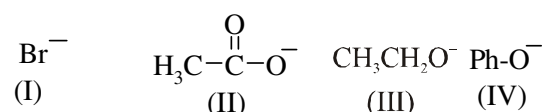
18. Which of the following reaction is feasible ?



19. Which reaction is least feasible

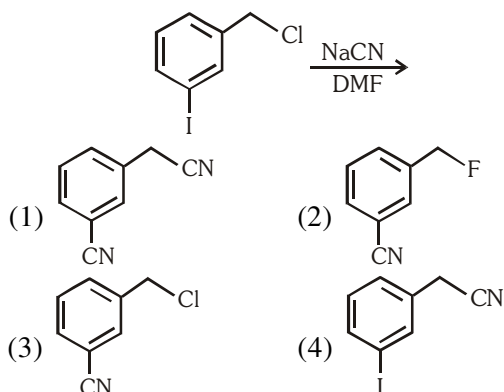


20. Arrange the following in order of their leaving group tendency?



- (1) I > II > III > IV (2) I > III > II > IV
(3) I > II > IV > III (4) I > IV > III > II

21. The structure of the major product formed in the following reaction is :



22. Which of the following on heating with aqueous KOH, produces acetaldehyde ?

- (1) $\text{CH}_2\text{ClCH}_2\text{Cl}$ (2) CH_3CHCl_2
(3) CH_3COCCl (4) $\text{CH}_3\text{CH}_2\text{Cl}$

23. $\text{R-OH} \xrightarrow{\text{Reagent}} \text{R-Cl}$

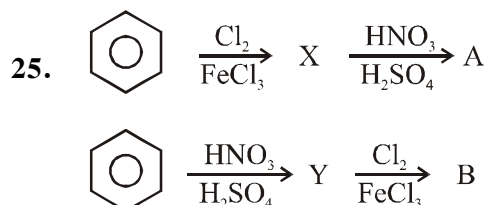
Which of the following reagents can be used for this reaction.

- (a) HCl/ZnCl_2 (b) NaCl
(c) PCl_3 (d) PCl_5
(e) SOCl_2
(1) a, c, d, e
(2) a, b, c, d
(3) a, b, d, e
(4) All of the above

24. $\text{R-OH} \xrightarrow[\text{Pyridine}]{\text{SOCl}_2} \text{R-Cl} + \text{SO}_2 + \text{HCl}$

This reaction follows which of the following mechanisms ?

- (1) $\text{S}_{\text{N}}1$ (2) $\text{S}_{\text{N}}2$ (3) $\text{E}1$ (4) $\text{E}2$



A and B are :-

- (1) Identical structure
(2) Position isomers
(3) Geometrical isomers
(4) None of the above

26. Match the following reactants in column-I with column-II, from the code given below :-

	Column-I	Column-II
(A)	Benzene + $\text{Cl}_2 \xrightarrow{\text{AlCl}_3}$	(1) Benzoic acid
(B)	Benzene + $\text{CH}_3\text{-Cl} \xrightarrow{\text{AlCl}_3}$	(2) Methyl phenyl ketone
(C)	Benzene + $\text{CH}_3\text{COCCl} \xrightarrow{\text{AlCl}_3}$	(3) Toluene
(D)	Toluene $\xrightarrow[\text{NaOH}]{\text{KMnO}_4}$	(4) Chlorobenzene
		(5) Benzene hexa chloride

	A	B	C	D
(1)	4	3	2	1
(2)	4	3	1	2
(3)	3	4	1	2
(4)	3	4	2	1

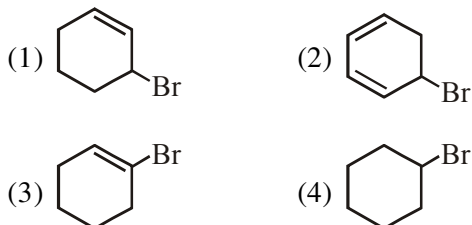
ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans	4	3	1	4	3	4	1	1	2	2	3	2	3
Que.	14	15					16	17	18	19	20	21	22
Ans	2	a-T, b-F, c-T, d-F, e-T, f-T, g-T, h-T					2	3	3	3	3	4	2
Que.	23	24	25	26									
Ans	1	2	2	1									

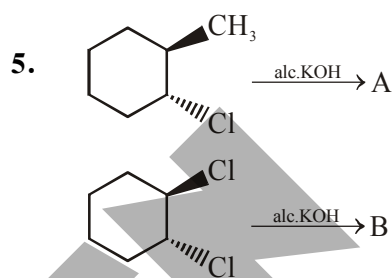
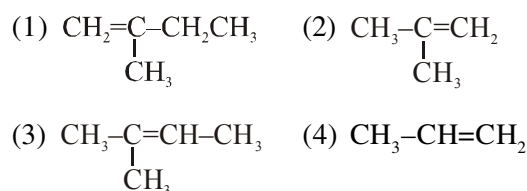
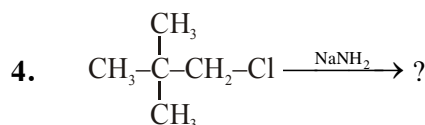
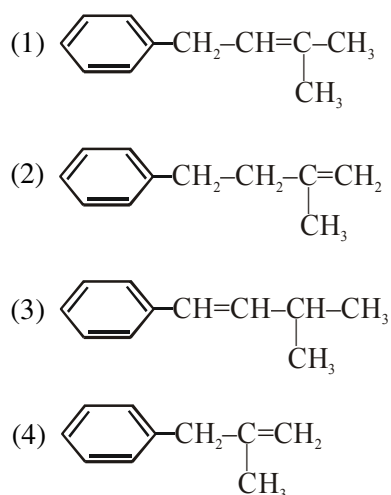
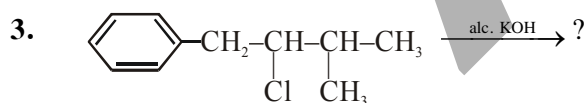
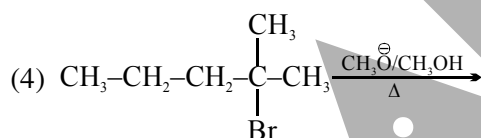
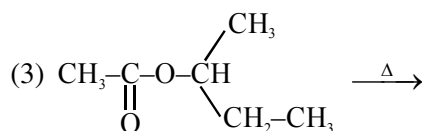
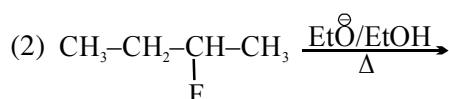
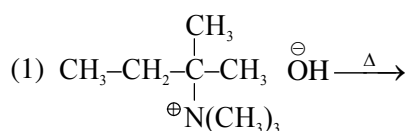
REACTION MECHANISM (PART-II)

RACE # 09

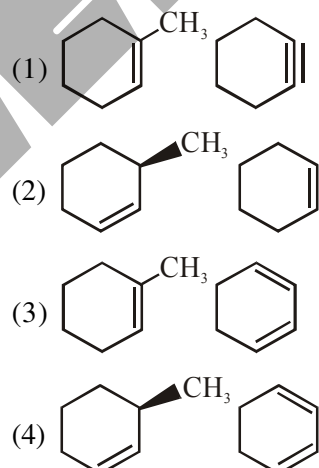
1. Which of the following is most reactive for dehydrohalogenation :-



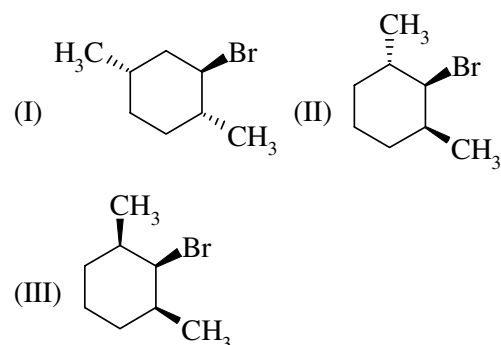
2. In which of the following reaction saytzeff's alkene is formed as major product :-



Product A and B (major) are respectively :

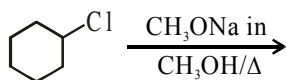


6. Arrange the following towards their reactivity for E_2 elimination?



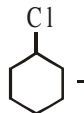
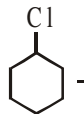
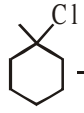
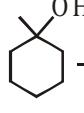
- (1) III > I > II (2) I > II > III
 (3) II > I > III (4) III > II > I

7. Given reaction mainly proceeds through –



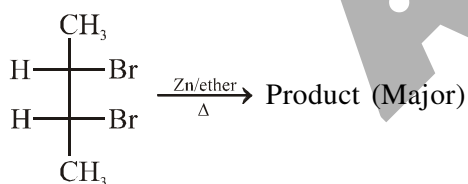
- (1) E_1 (2) SN^1 (3) SN^2 (4) E_2

8. Match the column-I and column-II and select the correct answer :

Column-I		Column-II	
(a)	 $\xrightarrow{\text{aq. KOH}}$	(p)	E_1
(b)	 $\xrightarrow{\text{alc. KOH}}$	(q)	SN^1
(c)	 $\xrightarrow{\text{H}_2\text{O}}$	(r)	SN^2
(d)	 $\xrightarrow{\text{H}^+/\Delta}$	(s)	E_2

- (1) (a-s); (b-r); (c-p); (d-q)
 (2) (a-r); (b-s); (c-q); (d-p)
 (3) (a-r); (b-s); (c-p); (d-q)
 (4) (a-q); (b-p); (c-r); (d-s)

9. In the given reaction



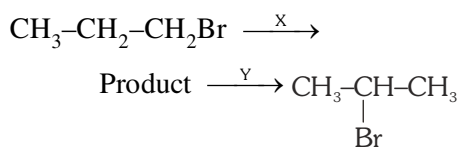
The product will be

- (1) Cis-2-butene
 (2) Trans-2-butene
 (3) 2-butyne
 (4) Buta-1, 3-diene

10. In E_2 elimination some compounds follow Hoffmann rule which means

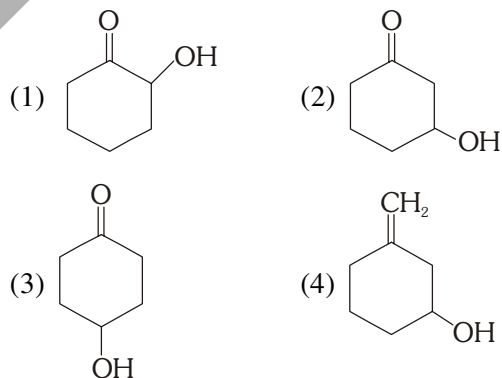
- (1) The double bond goes to the most substituted position
 (2) The compound is resistant to elimination
 (3) No double bond is formed
 (4) The double bond goes mainly toward the least substituted carbon.

11. Identify the set of reagents/reaction conditions 'X' and 'Y' in the following set of transformations :-



- (1) X = dilute aqueous NaOH, 20°C ,
 Y = $\text{Br}_2/\text{acetic acid}$, 20°C
 (2) X = concentrated alcoholic NaOH, 80°C ;
 Y = HBr/CHCl_3 , 20°C
 (3) X = dilute aqueous NaOH, 20° ,
 Y = $\text{Br}_2/\text{CHCl}_3$, 0°C
 (4) X = concentrated alcoholic NaOH, 80°C ;
 Y = $\text{Br}_2/\text{CHCl}_3$, 0°C

12. Maximum dehydration takes place that of -



13. Rate of unimolecular dehydrohalogenation :-

- (1) depends on concentration of base
 (2) does not depend on concentration of alkyl halide
 (3) do not affected by concentration of base
 (4) depends on concentration of both base and alkyl halides

ANSWER KEY

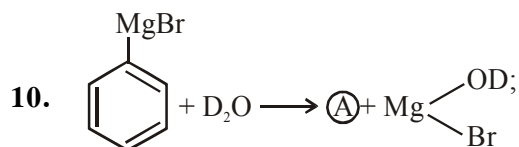
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13
Ans	2	4	3	3	4	4	4	2	2	4	2	2	3

HYDROCARBON

RACE # 10

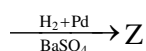
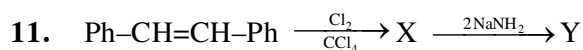
1. (1) (2) (3) (4)
2. 1-Bromo-3-chloro cyclobutane on reaction with 2-equivalent of sodium in ether gives (1) (2) (3) (4)
3. $\text{CaC}_2 \xrightarrow{\text{D}_2\text{O}} \text{A} \xrightarrow[\text{Cu tube}]{\text{Red hot}} \text{B}$; B is (1) (2) (3) (4)
4. $\text{CH}_2\text{OHCH}_2\text{CH}_2\text{COCH}_3 \xrightarrow{\text{Reagent}} \text{CH}_2\text{OHCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
Suitable reagent for above reaction is :- (1) Zn-Hg/HCl (2) $\text{NH}_2\text{NH}_2/\text{C}_2\text{H}_5\text{ONa}$ (3) Red P + HI (4) All
5. Wurtz reaction used for (1) Preparing unbranched alkanes (2) Preparing symmetrical alkanes (3) Preparing unsymmetrical alkanes (4) Preparing odd carbon number n-alkanes
6. The compound which produce propane on heating with HI in presence of red P is (a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{I}$ (b) $\text{CH}_3\text{CH}_2\text{CHO}$ (c) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ (d) $\text{CH}_3\text{CH}_2\text{COOH}$
(1) Only c (2) b, c (3) b, c, d (4) All

7. The compound that decolourises cold, dilute, alkaline KMnO_4 is :- (1) C_6H_6 (Benzene) (2) C_6H_{12} (3) C_6H_{14} (4) CCl_4
8. Give products of the following reactions :-
(a) $\text{CH}_2=\text{CH}_2 \xrightarrow[\text{(ii) Zn/H}_2\text{O}]{\text{(i) O}_3}$
(b) $\text{CH}_3-\text{C}(\text{CH}_3)=\text{CH}_2 \xrightarrow[\text{(ii) Zn/H}_2\text{O}]{\text{(i) O}_3}$
(c) $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3 \xrightarrow[\text{(ii) H}_2\text{O}]{\text{(i) O}_3}$
(d) $\xrightarrow[\text{(ii) H}_2\text{O}]{\text{(i) O}_3}$
(e) $\text{CH}_3-\text{CH}=\text{C}(\text{CH}_3)-\text{CH}=\text{CH}_2 \xrightarrow[\text{(ii) Zn/H}_2\text{O}]{\text{(i) O}_3}$
(f) $\xrightarrow[\text{(ii) Zn/H}_2\text{O}]{\text{(i) O}_3}$
(g) $\xrightarrow[\text{(ii) Zn/H}_2\text{O}]{\text{(i) O}_3}$
(h) $\xrightarrow[\text{(ii) Zn/H}_2\text{O}]{\text{(i) O}_3}$
(i) $\text{CH}_3-\text{C}(\text{CH}_3)=\text{CH}_2 \xrightarrow[\Delta]{\text{KMnO}_4}$
(j) $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3 \xrightarrow[\Delta]{\text{KMnO}_4}$
9. Identify the hydrocarbon which on ozonolysis gives :- (a) Only acetone (b) 1 equivalent of glyoxal + 1 equivalent of propanedial (c) 1 equivalent of CO_2 + 2 equivalent of formaldehyde (d) 1 equivalent of acetone + 1 equivalent of acetaldehyde

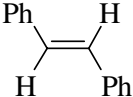
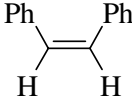
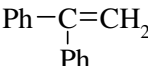


The compound A is :-

- (1) Benzene (2) Duetero benzene
(3) Duetero toluene (4) Both (2) & (3)



Product Z is

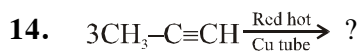
- (1)  (2) 
(3)  (4) $\text{Ph}-\text{C}\equiv\text{C}-\text{Ph}$

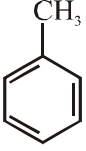
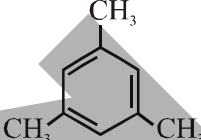
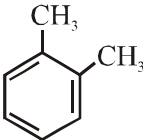
12. Among the following, the compound which has highest boiling point is :-

- (1)  (2) 
(3)  (4) 

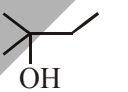
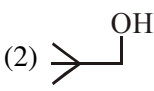
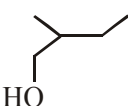
13. Which of the following will react with 1-butyne ?

- (1) $\text{AgNO}_3 + \text{NH}_4\text{OH}$
(2) $\text{Cu}_2\text{Cl}_2 + \text{NH}_4\text{OH}$
(3) Na
(4) All of them



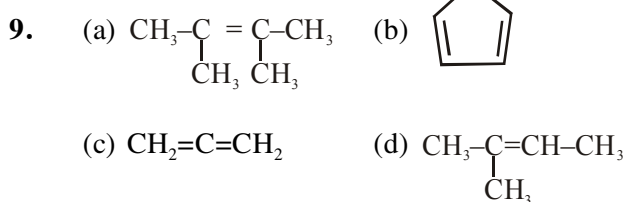
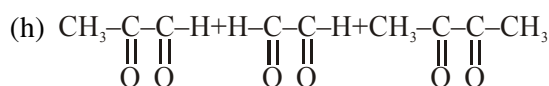
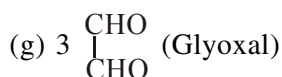
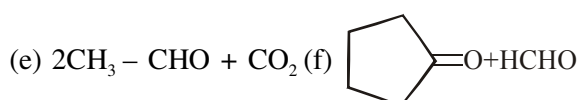
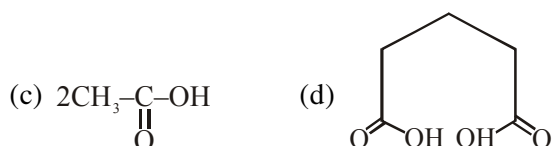
- (1)  (2) 
(3)  (4) 

15. Which compound on reaction with Cu at 300°C may not give aldehyde or ketone ?

- (1)  (2) 
(3)  (4) All of these

ANSWER KEY

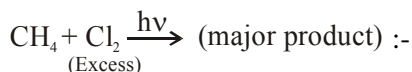
Que.	1	2	3	4	5	6	7	10	11	12	13
Ans	2	3	3	2	2	4	2	2	2	3	4
Que.	14	15									
Ans	3	1									



HALOGEN, OXYGEN & NITROGEN CONTAINING COMPOUNDS

RACE # 11

1. Which of the following statement is true for the major product obtained in the given reaction :-

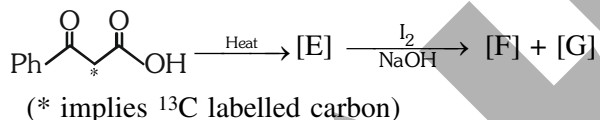


- (1) Reacts with $\text{AgNO}_3(\text{aq})$ to give white ppt of AgCl
- (2) Is used as an anaesthetic
- (3) Has zero dipole moment
- (4) All

2. Among the following the one that gives positive iodoform test upon reaction with I_2 and NaOH is-

- (1) $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{CH}_3$
- (2) $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{OH}$
- (3) $\text{H}_3\text{C}-\text{CH}(\text{CH}_3)-\text{CH}_2\text{OH}$
- (4) PhCHOHCH_3

3. In the following reaction sequence, the correct structure of E, F and G are :



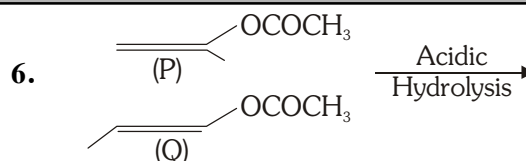
- (1) $\text{E} = \text{Ph}-\overset{*}{\text{C}}(\text{O})\text{CH}_3$, $\text{F} = \text{Ph}-\overset{*}{\text{C}}(\text{O})\text{O}^-\text{Na}^+$, $\text{G} = \text{CHI}_3$
- (2) $\text{E} = \text{Ph}-\overset{*}{\text{C}}(\text{O})\text{CH}_3$, $\text{F} = \text{Ph}-\overset{*}{\text{C}}(\text{O})\text{O}^-\text{Na}^+$, $\text{G} = \text{CHI}_3$
- (3) $\text{E} = \text{Ph}-\overset{*}{\text{C}}(\text{O})\text{CH}_3$, $\text{F} = \text{Ph}-\overset{*}{\text{C}}(\text{O})\text{O}^-\text{Na}^+$, $\text{G} = \text{CHI}_3$
- (4) $\text{E} = \text{Ph}-\overset{*}{\text{C}}(\text{O})\text{CH}_3$, $\text{F} = \text{Ph}-\overset{*}{\text{C}}(\text{O})\text{O}^-\text{Na}^+$, $\text{G} = \text{CHI}_3$

4. Benzoyl chloride is prepared from benzoic acid by -

- (1) Cl_2 , $h\nu$
- (2) $\text{SO}_2\text{Cl}_2/h\nu$
- (3) SOCl_2
- (4) Cl_2 , H_2O

5. Which of the following is a feasible substitution ?

- (1) $\text{R}-\text{Br} \xrightarrow{\text{Hg}_2\text{F}_2}$
- (2) $\text{R}-\text{Br} \xrightarrow[\text{acetone}]{\text{NaI}}$
- (3) $\text{R}-\text{Cl} \xrightarrow{\text{AgF}}$
- (4) All of these

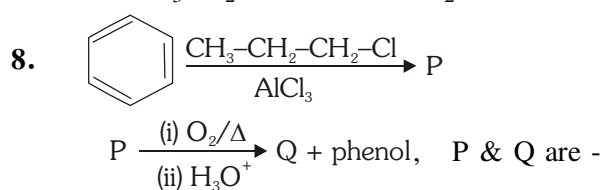


Product formed by (P) & (Q) can be differentiated by

- (1) 2, 4 DNP
- (2) Lucas reagent (ZnCl_2) conc. HCl
- (3) NaHSO_3
- (4) Fehlings solution

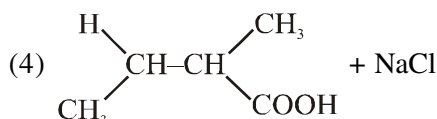
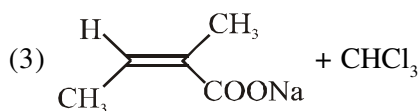
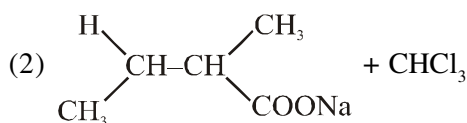
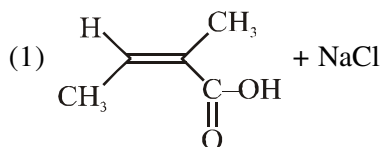
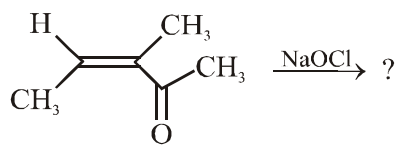
7. Compound A (molecular formula $\text{C}_3\text{H}_8\text{O}$) is treated with anhydrous CrO_3 to form a product B (molecular formula $\text{C}_3\text{H}_6\text{O}$). B forms a shining silver mirror on warming with ammonical silver nitrate. B when treated with an aqueous solution of $\text{H}_2\text{NCONHNH}_2$, HCl and sodium acetate gives a product C. Identify the structure of C:-

- (1) $\text{CH}_3\text{CH}_2\text{CH}=\text{NNHCONH}_2$
- (2) $\text{CH}_3-\text{C}(\text{CH}_3)=\text{NNHCONH}_2$
- (3) $\text{CH}_3-\text{C}(\text{CH}_3)=\text{NCONHNH}_2$
- (4) $\text{CH}_3\text{CH}_2\text{CH}=\text{NCONHNH}_2$

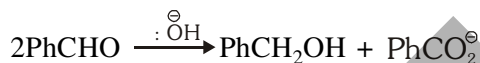


- (1) $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{CH}_3$ and $\text{CH}_3\text{CH}_2\text{CHO}$
- (2) $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{CH}_3$ and CH_3COCH_3
- (3) $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{CH}_3$ and CH_3COCH_3
- (4) $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{CH}_3$ and $\text{CH}_3\text{CH}_2\text{CHO}$

9. Identify the product in given reaction :-

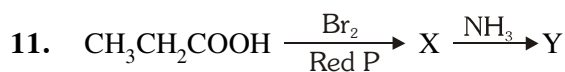


10. In Cannizzaro reaction given below :-



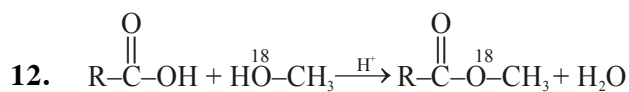
the slowest step is :-

- (1) The abstraction of proton from the carboxylic group
- (2) The deprotonation of PhCH_2OH
- (3) The attack of $:\text{OH}^-$ at the carboxyl group
- (4) The transfer of hydride to the carbonyl group



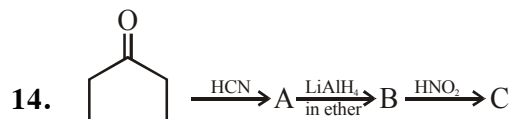
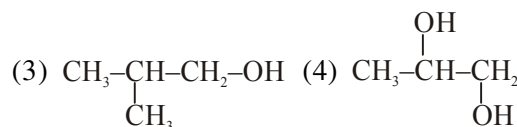
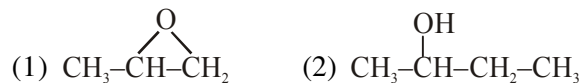
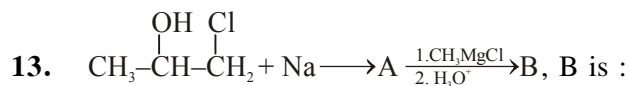
Y in the above reaction is -

- (1) Lactic acid
- (2) Ethylamine
- (3) Propylamine
- (4) Alanine

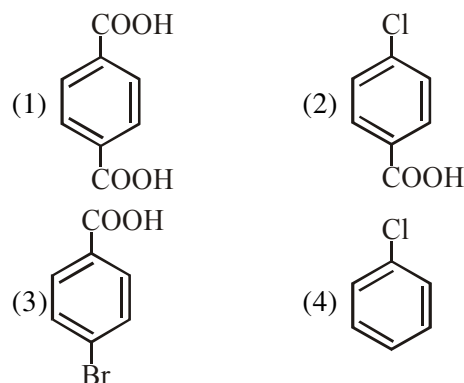
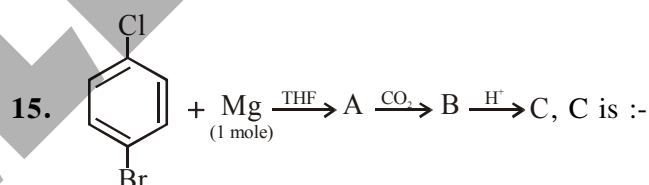
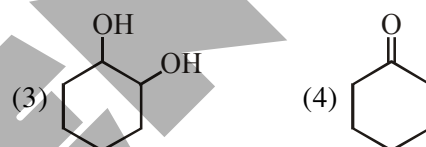


In above reaction $\text{CH}_3^{18}\text{OH}$ acts as :

- (1) Nucleophile
- (2) Base
- (3) Electrophile
- (4) Acid



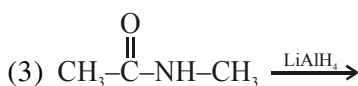
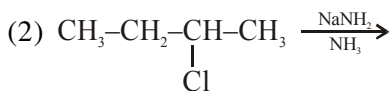
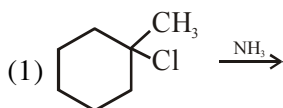
In above reaction major product (C) is :



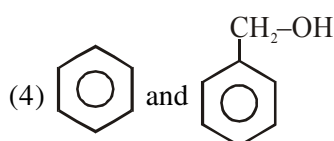
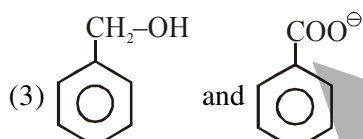
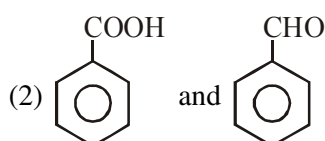
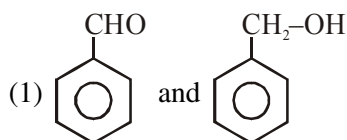
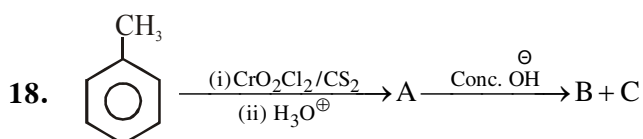
16. In the Hofmann bromamide degradation reaction, the number of moles of NaOH and Br_2 used per mole of amine produced are :

- (1) One moles of NaOH and one mole of Br_2
- (2) Four mole of NaOH and one mole of Br_2
- (3) Four moles of NaOH and two moles of Br_2
- (4) Two moles of NaOH and two moles of Br_2

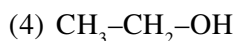
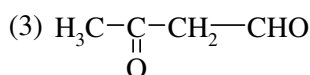
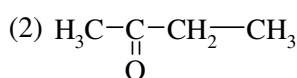
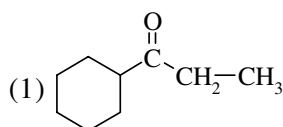
17. Amine is obtained as major product in



(4) All of these



19. Which of the following compound can form hydrazone and will give iodoform test but will not give Tollen's test ?



20. Which one of the following compounds will not be soluble in sodium bicarbonate ?

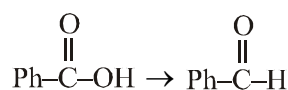
(1) Benzene sulphonic acid

(2) Benzoic acid

(3) o-Nitrophenol

(4) 2,4,6-Trinitrophenol

21. Find out correct sequence of reagent for following conversion :



(1) PCl_5 , CH_3MgBr

(2) CH_2N_2 , NaBH_4

(3) SOCl_2 , H_2/Pd , BaSO_4

(4) All of the above

22. The presence of primary amine can be confirmed by these reactions with except :-

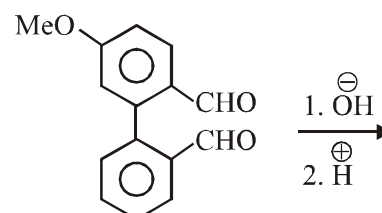
(1) HNO_2

(2) $\text{CHCl}_3 + \text{KOH}$

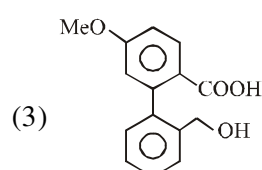
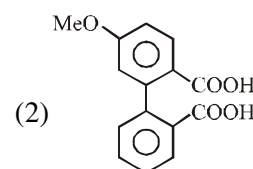
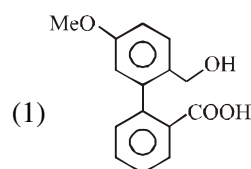
(3) CS_2 and HgCl_2

(4) H_2SO_4

23.



The major product formed in this reaction :-

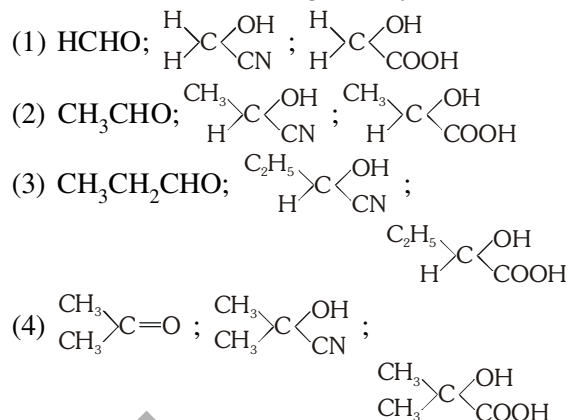


(4) None of these

24. Match the following :

a	Phenol + Neutral FeCl_3	p	No reaction
b	Phenol + Br_2 (aq.)	q	Violet colour
c	Phenol + NaHCO_3	r	White ppt.
d	Picric acid + NaHCO_3	s	CO_2 gas is evolved

25. A carbonyl compound 'A' reacts with hydrogen cyanide to form a cyanohydrin 'B' which on hydrolysis gives an optically active alpha hydroxy acid 'C'. 'A' gives a positive iodoform test 'A', 'B' and 'C' are given by the set :-

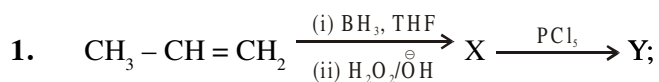


ANSWER KEY

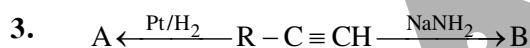
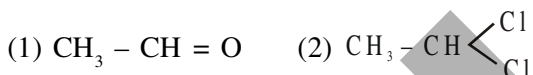
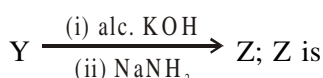
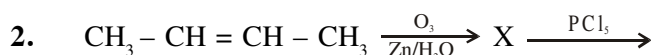
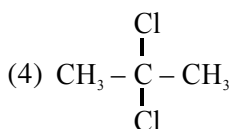
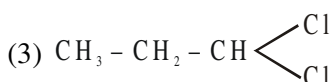
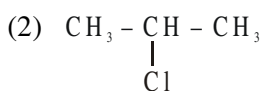
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13			
Ans	3	4	3	3	4	4	1	3	3	4	4	1	2			
Que.	14	15	16	17	18	19	20	21	22	23	24					
Ans	4	2	2	3	3	2	3	3	4	1	a-q, b-r, c-p, d-s					
Que.	25															
Ans	2															

BASED ON CONVERSIONS

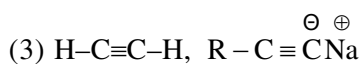
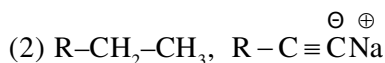
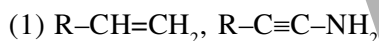
RACE # 12



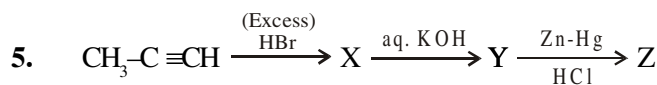
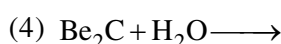
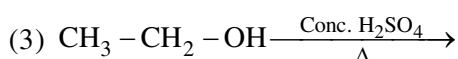
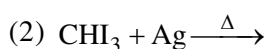
Y is



A & B are :-



4. Acetylene can be obtained by :-



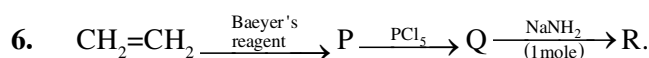
Which of the following is true regarding Z ?

(1) Its all carbon atoms are sp^3 hybridised

(2) It can be obtained in good yield by Wurtz reaction.

(3) It shows isomerisation reaction with HCl/AlCl_3 .

(4) All



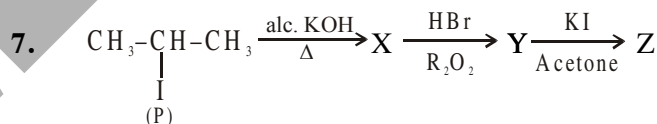
Which of the following statement is true regarding R?

(1) Has more dipole moment than ethylchloride.

(2) Has more C-X bond length than ethylchloride

(3) Is less reactive than ethylchloride for S_N reaction.

(4) All.



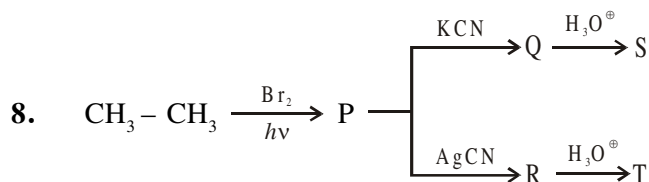
Initial compound (P) and the last product Z are :-

(1) Chain isomers

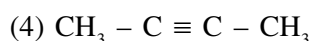
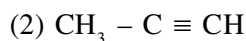
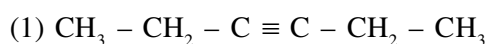
(2) Position isomers

(3) Homologues.

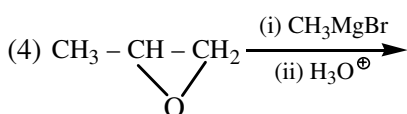
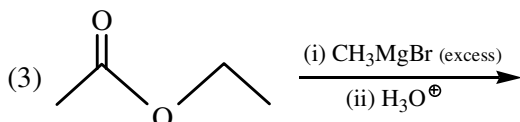
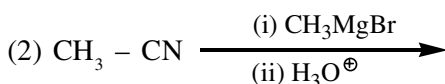
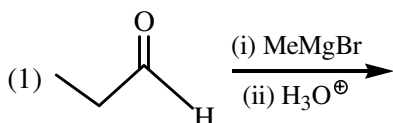
(4) Identical.



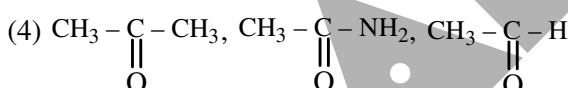
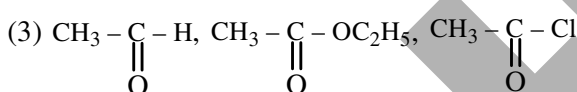
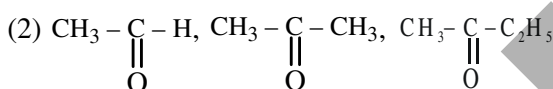
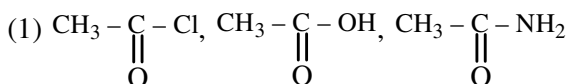
The products S & T can be obtained by ozonolysis of :



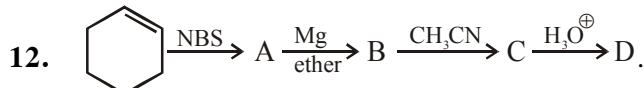
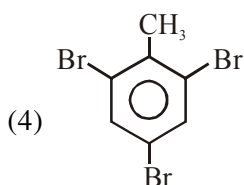
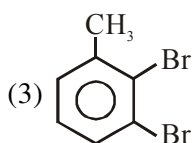
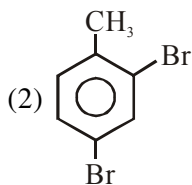
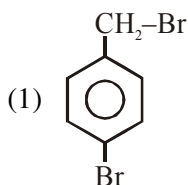
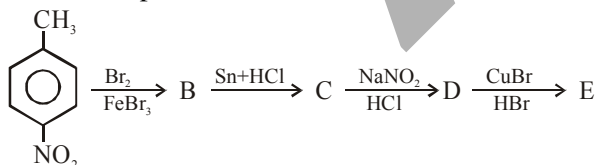
9. Which of the following reaction gives 3° alcohol



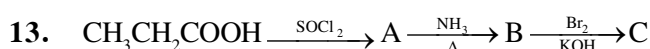
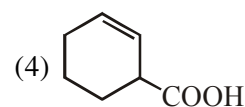
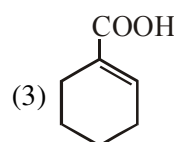
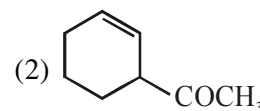
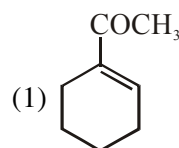
10. In which of the following group, each member can be reduced to alcohol by using NaBH_4 :



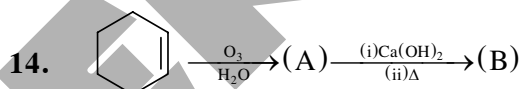
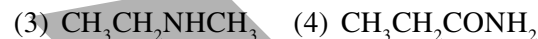
11. The end product E would be -



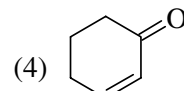
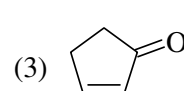
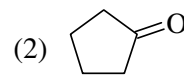
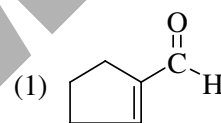
Product D is



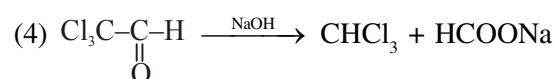
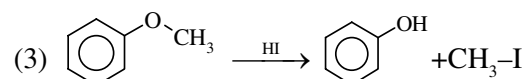
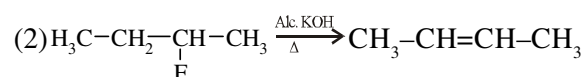
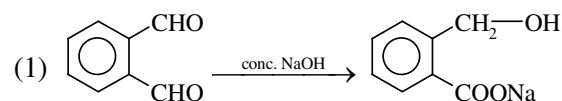
Structure of compound C is

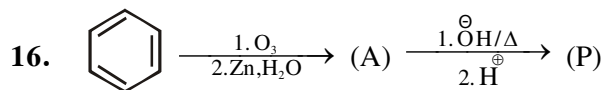


Product B is



15. Which of the following reaction is not correct according to major product

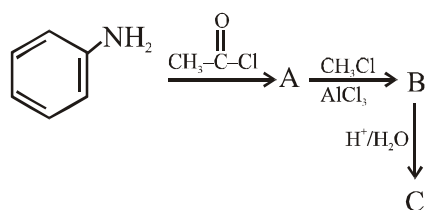




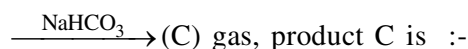
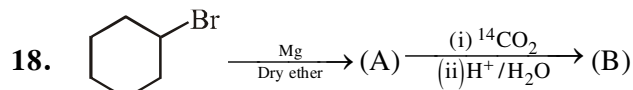
Product 'P' will be :-

- (1) $\begin{array}{c} \text{CHO} \\ | \\ \text{COOH} \end{array}$
- (2) $\begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{COOH} \end{array}$
- (3) $\begin{array}{c} \text{CH}_2\text{-OH} \\ | \\ \text{CH}_2\text{-OH} \end{array}$
- (4) $\begin{array}{c} \text{COOH} \\ | \\ \text{COOH} \end{array}$

17. Identify major product of following sequence of reaction :



- (1) CC(=O)Nc1ccccc1
- (2) Cc1ccccc1N
- (3) Cc1ccc(N)cc1
- (4) NC(=O)c1ccc(N)cc1

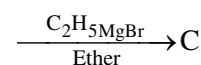
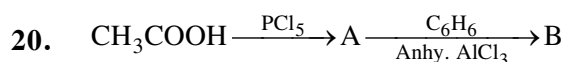


- (1) CO
- (2) $^{14}\text{CO}_2$
- (3) CO_2
- (4) A mixture of $^{14}\text{CO}_2$ and CO_2

19. (P) and (Q) in the following reaction is



- (1) CC1(C)CCCC1=O , CC1(C)CCCC1O
- (2) CC1=CCCC1=O , CC1=CCCC1
- (3) CC1=CCCC1=O , CC1(O)CCCC1=O
- (4) CC1(O)CCCC1=O , CC1=CCCC1=O



Product 'C' is :-

- (1) CC(O)CC1=CC=CC=C1
- (2) CC(C)(O)CC1=CC=CC=C1
- (3) CC(O)CC1=CC=CC=C1
- (4) CC(=O)CC1=CC=CC=C1

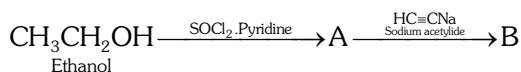
ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans	1	4	2	2	1	3	2	3	3	2	2	2	2	2	2
Que.	16	17	18	19	20										
Ans	2	3	3	4	2										

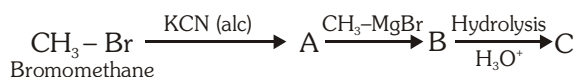
NCERT CONVERSIONS

RACE # 13

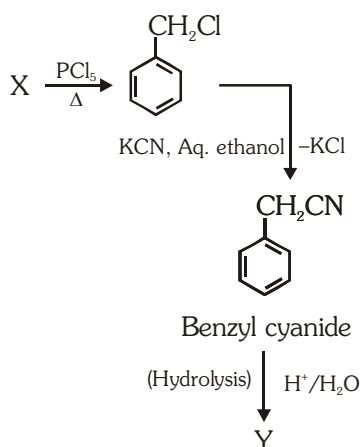
1. Find A & B



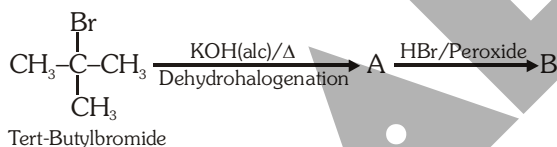
2. Find A, B & C



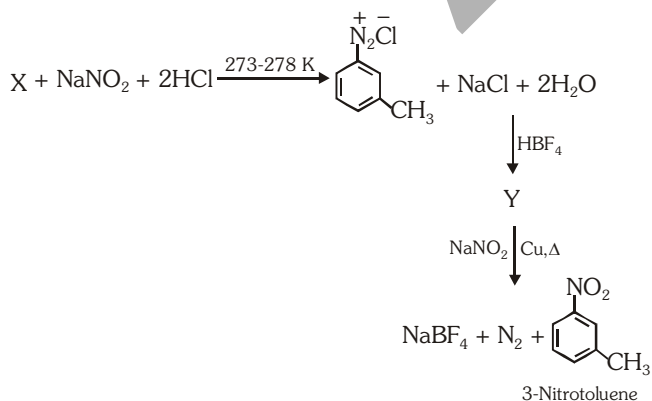
3. Find X & Y



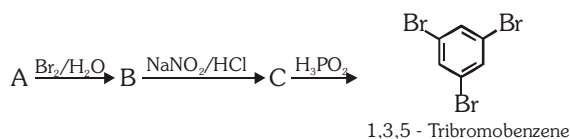
4. Find A & B



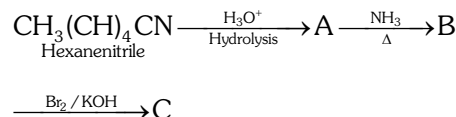
5. Find X & Y



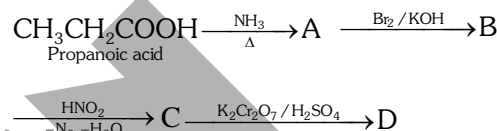
6. Find A, B & C



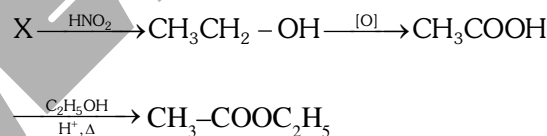
7. Find A, B & C



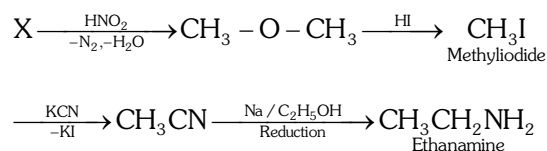
8. Find A, B & C



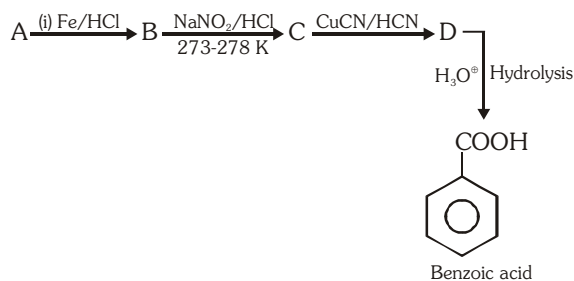
9. Find X



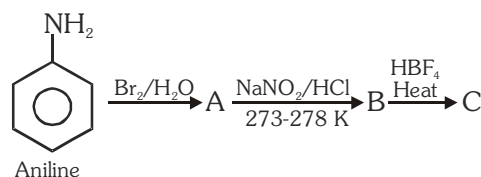
10. Find X



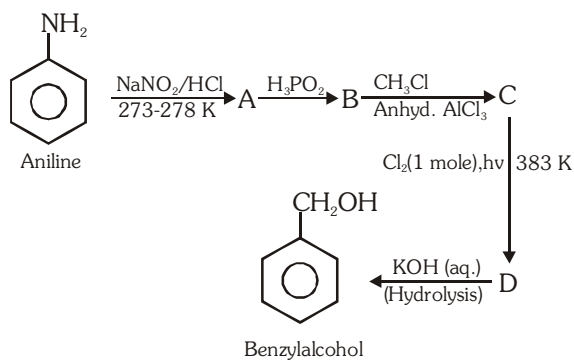
11. Find A, B, C & D



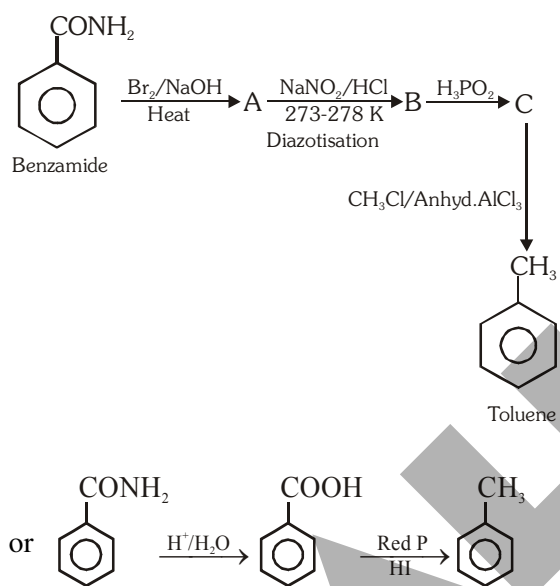
12. Find A, B & C



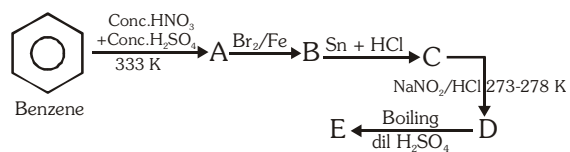
13. Find A, B & C



14. Find A, B & C



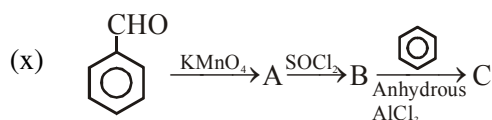
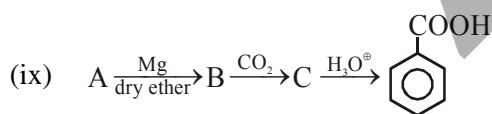
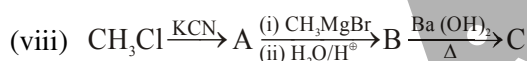
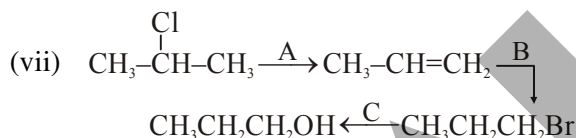
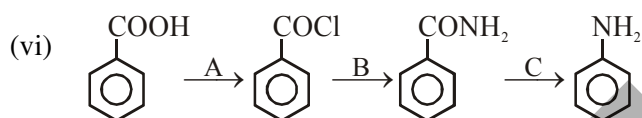
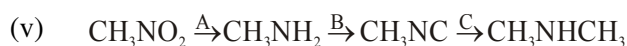
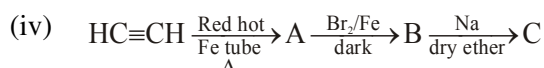
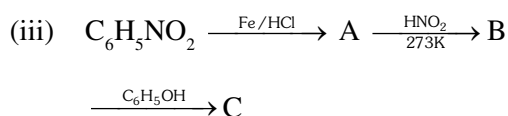
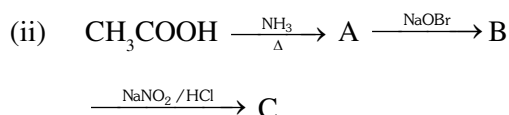
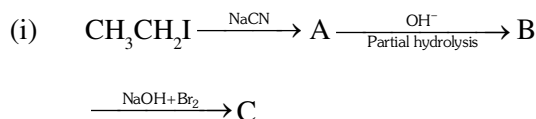
15. Find A, B, C, & D



NCERT CONVERSIONS

RACE # 14

1. Give the structures of A, B and C in following reaction ?



2. How will you bring about the following conversions in not more than two steps ?

- Ethanol to 3-Hydroxybutanal
- Bromobenzene to 1-Phenylethanol
- Benzaldehyde to 3-Phenylpropan-1-ol
- Benzene to *m*-Nitroacetophenone
- Benzyl chloride to 2-phenylethanamine